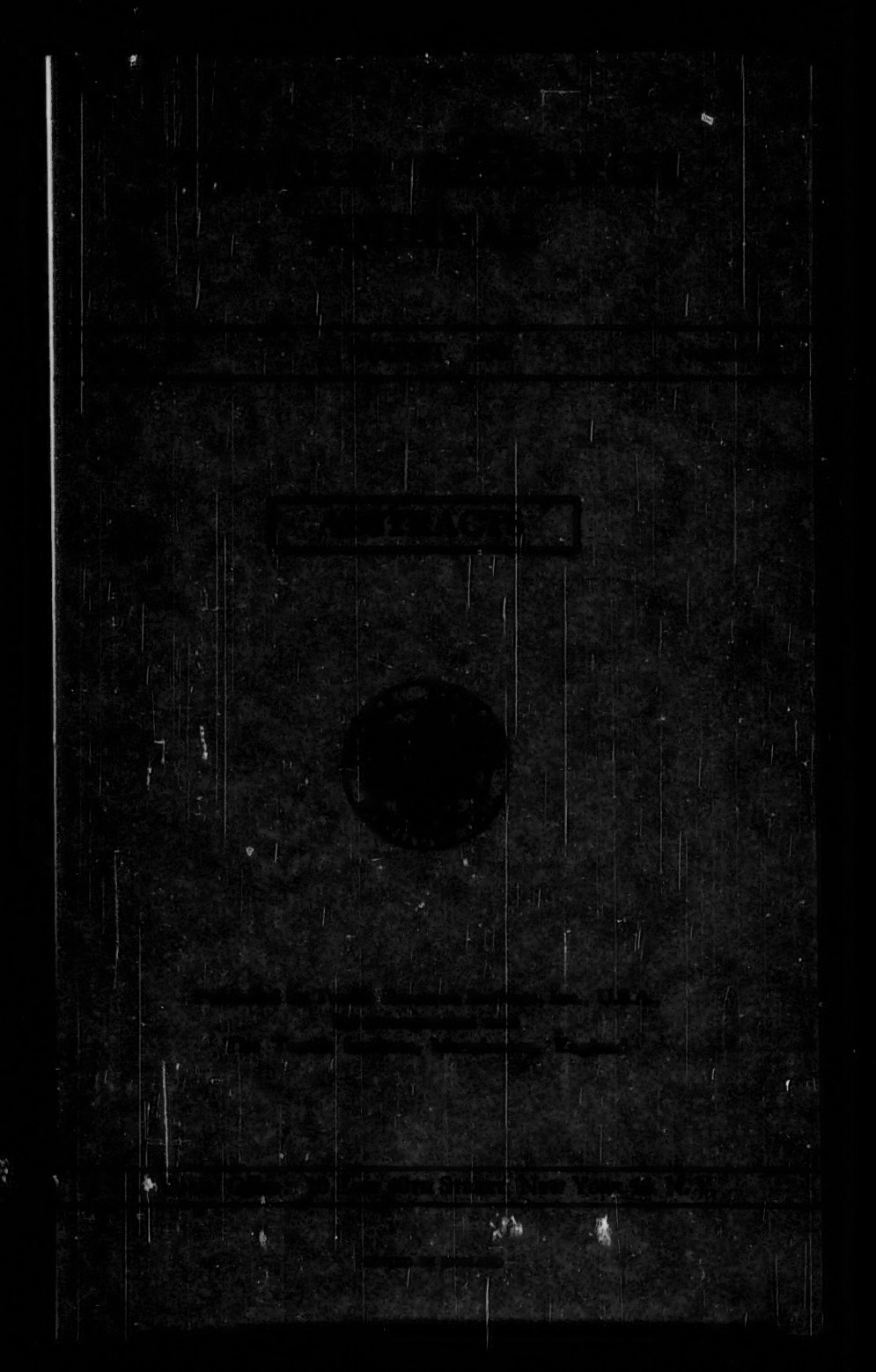

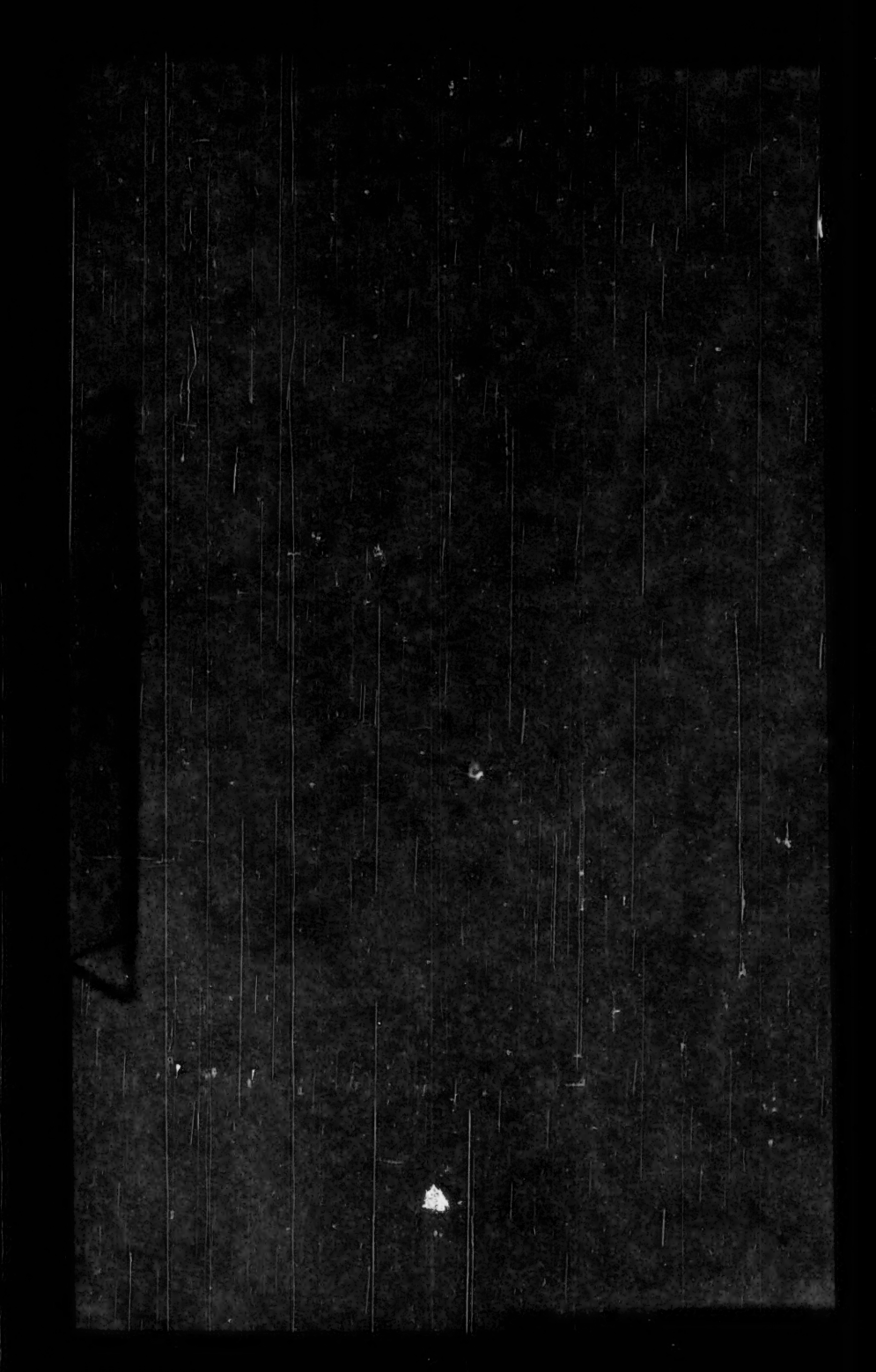

THE JOURNAL OF THE
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ABSTRACTS

(The titles which are set in bold-face are intended as "scanning titles" for ease in classifying and filing. Where these are not substantially the authors' titles the exact titles are set in parentheses.)

1—FIBRES AND THEIR PRODUCTION

(B)—ANIMAL

Silk: Production in Cyprus. *Annl. Rept. Dept. Agric., Cyprus*, 1949, 16 pages. References to sericulture are given on p. 9. Production of silk declined to 15,900 lb. in 1949. The Yeroskipos silk filature operated for a short time only but opened a weaving factory. C—**1B.**

South African Wool in Relation to the Woollen and Worsted Trade. J. C. de Klerk. *Farming in South Africa*, 1950, **25**, No. 288, 77-78. The differences between the woollen and worsted systems of manufacture are discussed for the benefit of the wool producer. The financial advantages of producing longer fibres are stressed, and the proportions of wool of different lengths produced in South Africa in 1947-1948 are tabulated. W—**1B.**

Sheep: Body Strike; DDT Preparation to Kill Blowflies. H. A. Veron. *Queensland Country Life*, 1950, **15**, No. 40, 6. Conditions favouring the rapid development of bacteria responsible for fleece rot are stated and the effects on the skin and wool are described. Protective and curative methods for treating stricken sheep with DDT preparations (including K.F.M. and Bovox) and with benzene hexachloride are discussed. W—**1B.**

Otter Sheep. S. W. McClure. *National Wool Grower*, 1950, **40**, No. 4, 18. A general description of the Otter sheep, a species which appeared in New England in 1791. The breed is believed to be extinct. W—**1B.**

Sheep in Australia: Infectious Diseases. H. Marsh. *National Wool Grower*, 1950, **40**, No. 4, 20-21. A general account of infectious diseases, including those which are carried from one sheep to another in dipping vats, and methods for controlling these diseases. W—**1B.**

Wool Growth: Effect of Environment and Other Factors. J. I. Hardy. *Text. Res. J.*, 1950, **20**, 189-193. A series of experiments designed to examine the length-rates of wool growth in different breeds of sheep is described. The clippings were taken every 42 days from the fine wools and every 28 days from the medium and coarse wools. These were measured by means of (*a*) a binocular microscope, and (*b*) a projection method where the fibres were placed between two lantern slides. It was found that wool grows fastest in the summer and early autumn, and that Merinos and Rambouillets grow wool at about one-fifth to one-third of a millimetre per day, Shropshires, Suffolks and Dorsets grow wool faster than Rambouillets and Merinos, but not so fast as Corriedales or Oxfords, all of which grow wool more slowly than Lincolns. The rate of wool growth for Lincolns is from about $\frac{1}{2}$ to $\frac{3}{4}$ mm. per day. W—**1B.**

Sheep Breeds: History and Evolution. (2) The Breeds of Great Britain. I. S. Miller. *N.Z. J. Agric.*, 1949, **79**, 227-236. Continuation of series of articles tracing the origin and development of New Zealand's sheep population. (For Part I, see *J. Textile Institute*, 1949, **40**, A309.) W—**1B.**

Sheep Breeds: History and Evolution. (3) Developments in New Zealand. I. S. Miller. *N.Z. J. Agric.*, 1950, **80**, 133-144. A historical account of the development of sheep breeding for mutton and wool in New Zealand. The article ends by giving details of present-day breeds and their distribution. W—**1B.**

Woolclassing: Standardisation in Australia. "Jason". *Pastoral Rev.*, 1950, **60**, 344 & 347. Standards for the classing and branding of wool clips which were adopted in Western Australia in 1931 are described; the steps which would have to be taken to bring about similar standardisation throughout Australia are briefly discussed. W—**1B.**

(C)—VEGETABLE

Cotton: Production in Barbados. *Annl. Rept. Dept. Science and Agric., Barbados*, 1948-49, 99 pages. The following references to cotton are noted. p. 14. The area planted increased to 721¾ acres. pp. 72-73 (D.R.D. Wiles). The total yield was 58,169 lb. of lint. The variety B1 is the standard type and several derivatives are under test, giving yields of more than 1,300 lb. of seed cotton per acre. The average maximum staple length is 60 mm. pp. 87-88 (N. A. Phillips). A report is given of the work of the experimental cotton spinning mill which produced 6,046 lb. of 24s ring yarn and 5,413 of 10s/5 cord. C—**1C.**

Cotton: Production in Cyprus. *Annl. Rept. Dept. Agric., Cyprus*, 1949, 16 pages. References to cotton production are given on p. 7. The area sown in 1949 was about 6,000 acres and the yield of lint about 334 long tons compared with an average of 11,760 acres and 599 tons in 1935-39. The popular strain is the American "Coker 100". C—**1C.**

Cotton: Production in Nigeria. *Annl. Rept. Agric. Dept., Nigeria*, 1948, pp. 75 (issued 1949). The following references to cotton are noted. pp. 20-21. The yield of Allen cotton was over 46,000 bales, the best crop since the 1940/41 record of 65,963 bales. Progress with the Allen 26C strain is mentioned. p. 39. No revival has occurred in the export of cotton from the Western Provinces. p. 61. Striking successes are reported at the Ibadan centre in the use of a DDT spray against the capsid bug *Helopeltis sanguineus*. pp. 63-65. Variety trials at the Zaria station are reported. pp. 72-74. Experimental work on insect pests is summarised. C—**1C.**

Cotton: Production in Uganda. *Annl. Rept. Dept. Agric., Uganda Protectorate*, 1947: Part I, Administrative, 63 pages; Part II, Experimental, 89 pages (issued 1949). The following references to cotton are noted. Part I. pp. 1-5. The problem of the reorganisation of the cotton industry is discussed. Statistics of production for the seasons 1939/40 to 1946/47 are tabulated; the latest figures are 1,253,257 acres, 138,457 tons of seed cotton, 204 lb. per acre, compared with the best season (1940/41) 1,284,206 acres, 220,059 tons and 384 lb. per acre. pp. 12-14. Separate reports of crop conditions and administration are given for the Buganda Province (pp. 23-24), the Northern Province (pp. 33-35), and the Western Province (pp. 44-45). pp. 53, 54. Statistics of production are tabulated for various districts. Part II, pp. 1-4. A report is given of the incidence of insect pests on cotton, pp.6-11. Work in the Kawanda Area on cotton breeding for resistance to Blackarm disease, verticillium wilt, *etc.*, is reported. pp. 11-30. Field trials on the effect of the date of sowing and on fertilisers are described. pp. 31-34. Similar information is given for the Serere Area. Experiment station reports are given for Kawanda, (pp. 35, 36, 50) and Serere (pp. 56, 57, 58, 64-67). C—**1C.**

Cotton: Production in Tanganyika Territory. *Ann. Rept. Dept. Agric. Tanganyika Territory*, 1947, 150 pages (issued 1949). The following references to cotton are noted. p. 5. The wet season favoured severe attacks by the American bollworm, the red bollworm and Blackarm disease. p. 8. Crop statistics are tabulated for the various provinces; the total production was 39,963 bales (400 lb.) compared with an average of 49,520 bales for 1939-1946. pp. 27-29. Agricultural experimental work (selection, manuring, *etc.*) is reviewed. p. 37. A list is given of public ginneries and their licensees. p. 38. Statistics of numbers of growers, seed distributed, tons of seed cotton marketed and cash returns to the natives are tabulated. Separate reports are given for the Eastern Province (pp. 54, 56, 57, 63), the Lake Province (p. 78), the Southern Province (pp. 107, 113), the Northern Province (p. 121), and the Tanga Province (p. 133). C—**1C.**

Cotton Plants: Formative Effects of 2:4-Dichlorophenoxyacetic Acid. Y. V. Rakitin, K. E. Ovcharov and E. V. Nizkovskaya. *C. r. Acad. Sci. U.R.S.S.*, 1948, **60**, 1073-1075 (through *Brit. Abstr.*, 1950, B III, 81). Spraying of cotton

plants with 0·0001 per cent. aqueous 2:4-dichlorophenoxyacetic acid has no effect; 0·001 per cent. to 0·01 per cent. solutions caused arrest of development of leaves, buds, blossoms and pods, with hypertrophy of the root. C—**1C.**

1-Naphthalene-acetic Acid and 1-Naphthalene-acetamide: Effect on Cotton Plant Development. Sucha Singh and V. A. Greulach. *American J. Botany*, 1949, **36**, 646-651 (through *Chem. Abstr.*, 1950, **44**, 2687[h]). Plants of Stoneville 2B cotton in a greenhouse were sprayed with various concentrations of 1-naphthalene-acetic acid and 1-naphthalene-acetamide when 57 days old and again when 71 days old. The former produced the more marked effects. The first application of 1-naphthalene-acetic acid produced strong epinastic effects. Growth of both the main stem and the fruiting branches were inhibited. The treatments did not influence area per leaf, but as a result of a decrease in the number of nodes on the branches there was a reduction in the number of leaves per plant. Leaf weight per unit area and per plant increased with the concentration of the growth substances, and the treated plants had thicker, darker green, and more leathery leaves, which wilted less easily. Total dry weight of the plants was not affected, and the total dry weight of the reproductive organs was only reduced by treatment with a high concentration of the growth substance. The treatments decreased the number of flowers per plant, but there was no great difference in the number of mature bolls per plant, so the percentage of boll set was higher in the treated plants. The final yield of seed cotton per plant was not affected significantly by any treatment. The treatments increased the weight per seed and the number of motes per boll, but the number of seeds per boll decreased in proportion. The treatments did not significantly influence the boll shed period, boll maturation period, weight of seed cotton per boll, lint index, or the tensile strength, length, or uniformity ratio of the fibres. C—**1C.**

Blackarm Resistant Cotton: Breeding in the Soviet Union. *Soviet News*, 1948, No. 2025, 4 (through *Rev. Appl. Mycol.*, 1950, **29**, 153). It is claimed that Soviet scientists working in Uzbekistan have developed crosses between American, Indian and Central Asian varieties of cottons which are completely immune from Blackarm disease. C—**1C.**

Cotton Seed: Dressing against Angular Leaf Spot Disease. N. Kaskaloglu. *Mahsul Hekimi* (*J. Plant Prot.*), 1949, **2**, 234-238, 268-269 (through *Rev. Appl. Mycol.*, 1950, **29**, 153). The pathogen of angular leaf spot (blackarm) of cotton was isolated on a medium of dextrose and cotton juice. In seed dressing experiments (in Western Anatolia) the best results were obtained with sulphuric acid, which completely eliminated infection from the stands of three sowings. In a final series of tests, concentrated sulphuric acid and formalin reduced the incidence of blackarm in the non-inoculated controls from 26·8 per cent. to nil, but their application presents difficulties. C—**1C.**

Holland: Flax Acreage. *Linen Trade Circ.*, 1950, **36**, May 20, 1. Land which has been reclaimed from the Zuyderzee has, so far, been found most suitable for growing flax, and a large proportion of the yearly acreage is already in the two new polders. By 1980 the whole of the Zuyderzee will have been reclaimed, and it is estimated that of the 562,000 acres, 47,500 acres will be suitable for flax-growing. Before the reclaiming of the Zuyderzee the total flax acreage of the Netherlands was 45,000 acres. The present capacity of the Dutch scutch mills, about 30,000 acres, can be increased to some 50,000 acres, by further modernisation. Various figures, past, present and predicted, are given for acreages. L—**1C.**

American Cotton: Breeding in Georgia, 1947/48. *Bull. Univ. Georgia*, 1948, No. 46, 62 pp. (through *Plant Breeding Abstr.*, 1949, **19**, 708-710). In the 28th annual report of the Georgia Coastal Plain Experiment Station for the year 1947-1948 a brief account is given of cotton breeding experiments. Varietal tests are reported. Pandora, a variety bred at the station, has given comparatively good yields since 1945. A test of commercial varieties and breeders' strains for wilt resistance is being carried out. Progress is reported in the breeding of Upland cotton. Several strains quite different in plant type from Pandora are being developed. From 492 different hybrids grown in 1947, there were 14 which showed enough hybrid vigour, as measured by yield to warrant further study. These gave an increase of 18 to 44 per cent. over the best variety. Crosses are being made to ensure a thorough testing of them in 1949. Crosses with many inbred lines are being made with a self sterile strain to determine the possibility of using it for hybrid production, and an attempt is being

made to transfer the sterility to a better parent. In other places the causes and manner of inheritance of this character are being studied. The South Carolina Sea Island cotton breeding project was transferred in 1948 to Tifton and consolidated with the Georgia Coastal Plain Experiment Station project. Sea Island–Egyptian–Tangüis hybrids are receiving special attention. Many progenies of Sea Island–Egyptian hybrids were in the fourth and fifth generations in 1948 and appear superior to Sea Island in production, picking quality and lint percentage. On the basis of fibre strength tests it is believed that some of the Sea Island–Egyptian combinations will produce fibre equal in strength to any of the present Sea Island lines. C—**1C.**

American Cotton: Breeding at the Mississippi Experiment Station. *60th Annual Rept. Mississippi State College*, 1947, 60 pp. (through *Plant Breeding Abstr.*, 1949, **19**, 710). Studies of the correlations between fibre quality, covering length, strength, and fineness show how costs may be reduced in a breeding programme involving these characters. Other studies are in progress to find ways of using foreign species in the improvement of the varieties now grown. One variety of cotton included in the *Verticillium* wilt tests at the Holly Springs Station seems to have a high degree of tolerance and is being used in a breeding programme to transfer wilt resistance to a locally adapted variety. Varieties such as Coker 100 Wilt, Stonewilt 6 and Coker 4-in-1 gave satisfactory yields in heavily infested soil. Twelve varieties of cotton were included in the tests at 7 locations in the Yazoo-Mississippi Delta. The programme of the Delta Branch Station centres round the production of a high yielding, rapid fruiting, early maturing strain with extra strong fibres of $1\frac{1}{16}$–$1\frac{3}{16}$ inch staple length and possessing other desirable characters. Straight line selection has been carried out in the variety Delfos. Several new strains superior to the older Delfos cottons in yield, ginning outturn, boll size and fibre quality and which retain their earliness and thin foliage have been developed, increased and distributed. The most recent release is Delfos 651–42–51. An attempt is also being made to obtain high yielding strains from Missdel, Deltatype Webber and other cottons characterised by exceptionally good spinning quality, but not grown because of their low yields. Hybridisation between these and other strains is being carried out. An intensive study is being made of characters which may affect cotton under mechanised production and harvesting and an enlarged programme of breeding strains suitable for complete mechanisation is in progress. Particular attention is being paid to a number of crosses between Delta Smooth Leaf and several commercial varieties now in the F_1 and to new hybrids between Delta Smooth Leaf and new strains. Tests of a smooth leafed strain against eight commercial varieties showed the advantages of smooth leaves as opposed to hairy ones as regards their influence on the grading of picked samples. Information obtained from spinning tests is being used to evaluate the fibre and spinning qualities of commercial varieties and of new strains which are being developed. C—**1C.**

American Cotton: Breeding in Oklahoma. *Biennial Rept. Oklahoma Agric. Expt. Sta.*, 1944-1946, 83 pp.; 1946-1948, 99 pp. (through *Plant Breeding Abstr.*, 1949, **19**, 713, 715). (1) Two new varieties are mentioned. Stoneville 62 has significantly outyielded the best variety previously available for eastern Oklahoma. It is the best seed producer in the State and has a far stronger fibre than most of the cotton grown in Oklahoma. Acala 6566-18 (Oklahoma Special) combines good yield with qualities giving high grades under south-western Oklahoma conditions. Strains of Acala 5 and Mebane 140 still in the breeding plots show promise for western Oklahoma. Breeding for resistance to bacterial blight has been facilitated by a rapid method, developed at the station, of determining varietal susceptibility. (2) Oklahoma Stoneville 62, Oklahoma Special, Acala 892 and Mebane 140 are appearing on farms in the State as fast as seed can be produced and there is a strong demand for Stoneville 62 by growers outside the State. Research has been facilitated by the new 300-acre Cotton Research Station near Chickasha. Tests indicate that Oklahoma-grown cotton is stronger than the same varieties grown in many other parts of the Cotton Belt. It thus appears that acceptable skein strength can be obtained in Oklahoma despite the somewhat shorter fibre which previous research has shown is best suited to the soil and climatic conditions. C—**1C.**

Belgian Congo Cotton: Breeding. *Publ. Inst. Nat. Agron. Congo Belge*, 1948, *Hors Sér.*, 217 pp. (through *Plant Breeding Abstr.*, 1949, **19**, 692). At the Gandajika

Experiment Station cotton pedigree selection is in progress. Thirteen series of pedigrees are under observation from various varietal crosses or selections from natural, hybrid populations. The wild species *Gossypium barbadense, G. brasiliense* and *G. peruvianum*, which are highly resistant to leaf curl have been used as pollinators for Gar. H/162, Delta and Triumph. The collection now includes 41 lines preserved for some special characters, and three separated plots of wild Congo *G. barbadense, G. brasiliense* and *G. peruvianum*. Multiplications and variety trials at the station and in different localities were also carried out. Technological tests at the Shirley Institute show that Gar 71 and 105 have good textile properties. At the Lubarika Station 1500 lines were under observation. The family obtained by pedigree selection has yielded 8 lines worth further selection. Several hybrids are under observation. A comparative trial of various lines showed that reselections of line 14/125, and especially of line 189, were of value, and they are to be multiplied on a large scale. C—**1C.**

Belgian Congo Cotton: New Varieties; Qualities and Methods of Multiplication. M. Lecomte. *Publ. Inst. Nat. Agron. Congo Belge*, 1949, *Ser. Tech.*, No. 36, 56 pages (through *Plant Breeding Abstr.*, 1949, **19**, 838). The problem of how to obtain new varieties to replace those in large-scale cultivation that have degenerated in the course of years is examined under the following headings and with special reference to the needs and conditions in the Belgian Congo: the degree of purity of the new variety and the qualities which it should have; methods of discovering and testing the new variety; methods of multiplication; and the subsequent control and distribution of varieties in the different regions of the Belgian Congo. The method of distribution recommended has been successfully used in introducing the variety Stoneville, as re-selected at Bambesa, into the Uele area. C—**1C.**

Russian Cotton: Breeding. *Pravda*, 1949, No. 101, 1 (through *Plant Breeding Abstr.*, 1949, **19**, 835). L. V. Rumševič of the Fergana Cotton and Lucerne Research Station was awarded a Stalin Prize for breeding the new cotton variety 108-F. It is remarkably productive and 8–10 days ahead of other varieties, as a result of which it produces more bolls opening in September and October. The variety has been tested on a commercial scale. Another variety 137-F, selected by Rumševič is undergoing State Varietal Tests; 137-F is both earlier and more productive than 108-F and has larger bolls. Mičurinite methods are used at the station in breeding new cotton varieties. C—**1C.**

Cotton: Cultivation in Nyasaland, 1948. *Rept. Dept. Agriculture, Nyasaland Protectorate*, 1948, part I, 5-6, 8, 15, 19. A report is given of the planting, growing, and harvesting of cotton in Nyasaland in 1948. Cotton seed production in various districts on native trust land, by native tenants on private estates, and on European estates is tabulated. The amounts of seed cotton grown on various districts of Native Trust Land and purchased at the Native Produce Markets are also shown. Damage to cotton crops by the Red Bollworm, stainers, the Pentatomid, and the Capsid is reported. C—**1C.**

American Cotton: Variety Tests in Arkansas, 1941-1945. D. B. Shank. *Bull. Arkansas Agric. Exp. Sta.*, 1948, No. 475, 80 pp. (through *Plant Breeding Abstr.*, 1949, **19**, 838). The results of tests on commercial varieties and new strains of cotton conducted at various locations in Arkansas during the period 1941 to 1945 inclusive are reported. New varieties released since 1941 comprise Rowden 60A, Arkot 1 and Arkot 2. Rowden 60A was derived from the old line of Rowden designated 6016. Arkot 1 is another selection of Rowden, derived from strain 6015; it has shown outstanding fibre quality as a short-staple cotton. Arkot 2 is the former strain E4; it originated from Stoneville 2-B and is somewhat more resistant to *Fusarium* wilt than its parental stock. C—**1C.**

Cotton Variety and Strain Testing Experiments: Simple Lattice Design. T. A. Bancroft and A. L. Smith. *Agron. J.*, 1949, **41**, 157-160 (through *Plant Breeding Abstr.*, 1949, **19**, 834). The relative efficiencies of 38 simple lattice designs as compared with randomised block lay-outs have been compared in field tests involving 16, 25 and 36 cotton varieties. The differences in efficiency between the various lattice designs were slight. The gain in efficiency over randomised blocks averaged 18 per cent., but was occasionally as high as 92 per cent. C—**1C.**

Sea Island Cotton: Infection with Vesicular-arbuscular Mycorrhiza. A. Johnston. *Tropical Agriculture*, 1949, **26**, 118-121. A general survey was made to find the distribution and morphological variation of vesicular-arbuscular mycorrhiza in a representative sample of the Trinidad flora. Mycorrhiza occurred in 86 per cent. of the species examined. Two types of endophyte were recognised, differing in the mode of degeneration of the fungus in root cells. These are the "sporangiolar" and "intracellular hyphal" types and are illustrated. A more detailed investigation of mycorrhiza in Sea Island cotton showed that the fungus was affected by the soil, that with abundant organic matter being most favourable to its development. A pot experiment showed that mycorrhiza was not essential for growth in young cotton plants, but varied in importance with soil conditions. It was beneficial in poor soil and possibly in that rich in organic matter, whereas in the presence of plentiful inorganic nutrients and little organic matter it had no effect. C—**1C.**

Cotton Insect Pests: Control. L. D. Newsom and C. E. Smith. *J. Econ. Entomol.*, 1949, **42**, 904-908 (through *Chem. Abstr.*, 1950, **44**, 3661[h]). The effects of various insecticides (toxaphene, benzene hexachloride–DDT–S mixture, Chlordan, and calcium arsenate alone or mixed with one of the following materials: nicotine, benzene hexachloride; rotenone + piperonylcyclonene) on populations of predators of the cotton aphid, bollworm, and spider mites on cotton plants are described. All these insecticides reduced the numbers of predators. The new organic insecticides were more destructive to two predators (*Geocoris punctipes*, *Orius insidiosus*) than Ca arsenate + nicotine. C—**1C.**

Honeydew in Acala Cotton: Detection. ("Having Trouble with the New Acala Cotton?") M. F. Stansbury and C. L. Hoffpauir. *Textile World*, 1950, **100**, No. 5, 95, 318; and *Textile Industries*, 1950, **114**, No. 5, 89. The Molisch test for sugars is applied to the detection of "honeydew" on raw cotton. Honeydew, the excreta of aphids, causes excessive lapping in the drafting of Acala cotton. C—**1C.**

World Cotton Crop, 1949-50. United States Department of Agriculture. *Textile Weekly*, 1950, **45**, 1632-1636. The current estimate of the world crop for 1949-50 is 31,220,000 bales (500 lb.), of which the American crop is 16,127,000 bales. Notes from various countries are provided and a table gives acreage and production figures for 1935/39, 1940/44 (averages), 1948 and 1949 for all cotton-growing countries. C—**1C.**

Ramie: Production and Utilization. W. Spoon. *Ber. Afdel. Trop. Producten, Kon. Vereen. Indisch. Inst.*, No. 226 (reprint from *Landbouwk. Tijds.*, 1950, **62**, 40-45). A renewed interest in the growing of ramie in Indonesia and Surinam is noted and two lots of ramie from Java are described. Finished articles made from ramie have been tested in the home. The pure ramie fabric is harsh, but good materials can be made from ramie/rayon staple mixtures. Divergency in the quality of the raw fibre causes much trouble in the degumming process and hinders development of the industry. Ramie cake from the leaves can be used for cattle feeding; an analysis is given and compared with that of lucerne or alfalfa. C—**1C.**

(D)—ARTIFICIAL

Wood Pulps: Alkaline Purification and Acetylation. Georg Jayme and Udo Schenck. *Das Papier*, 1949, **3**, 469-476 (through *Chem. Abstr.*, 1950, **44**, 3250[f]). Work on the effect of hemicellulose content on the reactivity of dissolving pulps has been continued. The passivity towards acetylation of bleached spruce dissolving pulps subjected to cold alkaline purification could be reduced partially by a subsequent alkaline treatment at 110° C. Stocks of high purity were obtained, though their acetylation reactivities were below those of purified cotton linters. The passivity of pulps purified with cold aqueous caustic soda is ascribed to the formation of cellulose hydrate, which is then partially reconverted on hot purification into "native cellulose". C—**1D.**

Glass Spinnerets. ("Spinndüsen aus Glas.") —. Gaebel. *Kunstseide u. Zellwolle*, 1949, **27**, 429-430. Glass and metal spinnerets are compared and their relative advantages are discussed. Glass spinnerets are preferred for the production of viscose rayon filaments and certain of the new protein fibres. C—**1D.**

Viscose Rayon: Sticking of Filaments. A. I. Meos and N. I. Selivanov. *Tekstil. prom.*, 1948, No. 3, 16-18 (through *Brit. Abstr.*, 1950, B II, 232). "Stuck

filaments" obtained in viscose staple fibre production differ from freshly-spun filaments artificially bonded together with viscose and treated again in the spinning bath; they are more easily separated and do not dye more intensely than do normal filaments. Stuck filaments may be prevented by increasing the length of immersion in the spinning bath. C—**1D.**

Alginate Rayon: Application in Textile Processes. ("Neue Möglichkeiten der Textiltechnik mit Hilfe von Alginat-Kunstseide.") *Kunstseide u. Zellwolle*, 1949, **27**, 425-429. New uses for alginate rayon filaments in spinning, weaving, knitting, lace-making, dyeing and finishing are reviewed, with special reference to developments in England. C—**1D.**

Straw Pulps: Preparation. ("Expérimentation comparative de divers procédés de préparation de pâtes de paille.") Roger Renaud and Jean Français. *Mém. Services Chim. État*, 1948, **34**, 205-240. A comparison has been made of six different processes for the commercial production of straw pulps. All the processes yield pulps of very good quality of similar chemical composition. The choice of process for bulk production should therefore be based on purely industrial considerations, such as geographical location, costs of reagents, *etc.* C—**1D.**

"Pacific" Tow-to-sliver Converter. J. H. Kennedy. *Textile World*, 1950, **100**, No. 5, 75-84. The Pacific Converter changes continuous filament tow, regardless of kind or type of fibre, into a sliver of predetermined fibre length. Various aspects of the use and operation of this machine are discussed and illustrated. These include mode of operation, drafts, settings and adjustments, comparison with conventional systems, and difficulties. C—**1D.**

Rayon Cake Holder. Manchester Metal Works Ltd. *Textile Mercury & Argus*, 1950, **122**, 974. Illustrations are given of a rayon cake holder made of six linked members mounted on a common spindle. It is shown in the open form, fitted to a flyer spindle, and folded up without the flyer. C—**1D.**

Alginate Rayon: Production and Application. ("Über Alginat-Kunstseide.") *Kunstseide u. Zellwolle*, 1950, **28**, 11-12. The method of producing alginate yarn from alginic acid extracted from seaweed is briefly reviewed. The application of the soluble alginate yarn in the weaving of light-weight wool fabrics is described and illustrated. C—**1D.**

Cellulose Xanthate: Formation. ("Sur les conditions pour la formation d'un xanthate de cellulose sodique soluble.") André Bréguet, Robert Viatte and Colette Chareyron. *Mém. Services Chim. État*, 1948, **34**, 157-162. A study has been made of the conditions necessary for the formation of a completely soluble xanthate from a sulphite pulp and commercial reagents. The results show that the production of a good technical viscose demands: (i) complete destruction of the native structure of the cellulosic fibre; (ii) the use of a range of concentration for the steeping liquor which is strictly correlated to the step of the Vieweg curve (16 to 21 per cent. NaOH) without taking account of the moisture contained in the cellulose sheets; and (iii) a percentage of combined S in the xanthate corresponding to one group $S{:}C{\cdot}S-$ for two $C_6H_{10}O_5$. C—**1D.**

Cuprammonium Rayon: Stretch-spinning Mechanism. ("Die mechanischen Vorgänge beim Spinnprozess des Kupferkunstseide-Streckspinnverfahrens." Teil A[1].) Viktor Elsaesser. *Kolloid-Z.*, 1948, **111**, 174-190. The cuprammonium rayon stretch-spinning process is described and the fundamental equations of the spinning process and the determination of the magnitudes characterizing the spinning process are discussed. ([1]For parts B and C see *J. Textile Institute*, 1950, **41**, A280 and A340.) C—**1D.**

Cyano-ethylcellulose Rayons. ("New Family of Rayons.") J. A. Somers. *Brit. Rayon and Silk J.*, 1950, **26**, May, 62-63, 88. Cyano-ethylcellulose ethers obtained by the reaction of viscose with acrylonitrile are being developed as artificial fibres. The conditions governing the formation of these ethers are discussed, the spinning process and properties of the fibres are briefly described. Reference is made to the patent specifications covering the process. C—**1D.**

Vegetable Protein Fibres: Production and Properties. ("Les fibres de protéines végétales.") J.-P. Sisley. *Teintex*, 1950, **15**, 225-237. A review of some recent developments in vegetable protein fibres. The properties of Lanital

and "Fibre L" are briefly discussed. The production, properties, *etc.*, of other vegetable protein fibres are dealt with under the following headings: (i) Peanut protein fibres; (ii) Soya bean protein fibres; (iii) Cottonseed protein fibres; and (iv) Zein fibres. A fairly extensive bibliography is given. **C—1D.**

Amilan Fibre: Preparation and Uses. Kohei Hoshino and Sukehane Funami. *J. Soc. Org. Synthetic Chem. (Japan)*, 1949, **7**, 2-3 (through *Chem. Abstr.*, 1950, **44**, 3895[h]). Phenol was hydrogenated in presence of nickel to cyclohexanol, then dehydrogenated to cyclohexanone with copper as the catalyst, converted to its oxime with hydroxylamine, then by Beckmann rearrangement to ε-caprolactam, which was hydrolysed to 5-amino-*n*-caproic acid and then dehydrated and polymerised to $[NH\text{-}(CH_2)_5CO]_m$ (Amilan, $m = 100-50$). This was spun, drawn, and baked to amilan fibres and filaments, and used for brush bristles, fish lines, and shoe laces. **C—1D.**

Polyamides: Preparation. W. Voss. *Chem. Tech.*, 1949, **1**, 111-117 (through *Chem. Abstr.*, 1950, **44**, 3718[b]). Polyamide production in the German fibre industry is considered briefly, and the German method of manufacturing Perlon L from phenol is compared with the American method of manufacturing nylon from furfural. The synthesis of both is shown (in the original) by formulæ and flow-sheets. **C—1D.**

PATENTS

Artificial Fibre Tow Drying Apparatus. Courtaulds Ltd. and R. L. Wormell. B.P.629,818 of 12/12/1947:28/9/1949. In a process for drying a continuous tow of artificial fibre (usually 10,000 to 200,000 denier) the tow is fed in convolutions on a travelling belt (usually of woven wire), conveyed through at least one drying chamber and taken off vertically downwards to a collecting device. In one arrangement the dried tow drops slightly from one belt to a pair of belts and is taken off through the gap between them. In another arrangement the conveying system is just one pair of belts with a gap between them. C.

Dielectric Heating Apparatus for Drying Rayon Cakes. Radio Corporation of America. B.P.629,979 of 15/7/1947:3/10/1949 (Conv. 31/12/1941). When using a prior apparatus for drying rayon cakes by a combination of radio-frequency heating and evacuation (B.P.563,590) it was found that the power demand on the oscillation generator fell off considerably as drying proceeded and a more powerful generator was required than was actually necessary during most of the drying cycle. The present invention seeks to maintain balance by effecting the drying in stages in one apparatus, fresh wet cakes being loaded at one point and dry cakes removed at another. (See B.P.563,590; *J. Textile Institute*, 1944, **35**, A457.) C.

Rayon Liquid Treatment Thread-advancing Device. North American Rayon Corporation. B.P.630,079 of 9/8/1946:5/10/1949 (Conv. 9/8/1945). A device for advancing thread in a continuous process of rayon extrusion and treatment includes a rotary reel structure provided around its circumference with blades that co-operate with adjacent stationary ribs and can move longitudinally or radially of the ribs in such sequence that the thread is thereby advanced. The blades are mounted so that each constitutes a pivoted member of a four-bar linkage system, the axes of the pivots being transverse to the direction of the longitudinal movement of the blades. Details are shown in seven sheets of machine drawings. C.

Fibre-stapling and Sliver-forming Apparatus. W. W. Triggs (for Pacific Mills Corporation). B.P.630,131 of 26/4/1946:6/10/1949. The invention relates to a method and apparatus for converting a web of continuous fibre (alone or mixed with other fibre) into drafted sliver of staple fibre ready for spinning. The preferred method takes the following steps. (1) The continuous fibre (*e.g.* rayon) is drawn from packages through apertures in a guide frame and assembled into a flat web. (2) The web is passed over a hard surface under a helical steel cutting roller and thus divided into strips inclined at an angle of about 10° to the direction of travel. The spaces between the flutes of the cutting roller are filled in with rubber to assist in forwarding the web. (3) The cut strips are "debonded" by passing the web between fluted drafting rollers and co-operating forwarding aprons, some rollers being slower and others faster than the first one, whereby the staple fibres are "worked" up and down and trailing ends of fibres are wiped free from adherent fragments. (4) The web is submitted

to a "shearing" and drafting action by passage on a travelling apron under a series of faster rollers and aprons. This produces a thin web in which few fibres are co-terminous. (5) The web is rolled into a sliver by passage through a cylinder that is diagonally inclined in the opposite direction to the inclination of the strips and is rotated in the sense that the lower surface moves against the line of flow of the web. Static electricity is discharged by means of a pair of earthed rollers and by supplying moisture. (6) The sliver is collected in a convenient form for drafting and spinning. Other fibres such as wool may be introduced at step (1) in which case they will suffer the same cutting, or after step (4). Details of the mechanism are shown in five sheets of machine drawings. C.

Cellulose Acetate for Moulding: Production. British Celanese Ltd. B.P. 630,388 of 10/6/1947: 12/10/1949 (Conv. 2/7/1946). Cellulose acetate of good stability and low content of combined sulphuric or other inorganic acid is obtained by acetylating cellulose (*e.g.* cotton linters) in the presence of an acid catalyst, ripening the primary product, neutralising the free acid (*e.g.* by means of magnesium acetate solution) injecting steam until the temperature rises to 60° C. at least, acidifying with a further quantity of the inorganic acid and maintaining the steam for about 15 minutes until the temperature has reached about 100° C. C.

Cellulose Acetate Yarn: Strengthening by Stretching. T. B. Frearson and E. A. Goodall (British Celanese Ltd.). B.P.630,390 of 24/6/1947: 12/10/1949. Cellulose acetate yarn is stretched by about 80 per cent. of its extensibility, softened by steaming under pressure, and then stretched again to as much as 20 times the original length. The process may be applied to single yarns, warps or bundles of yarn of 100,000 to 500,000 denier. C.

Fur, Hair or Wool: Recovery from Hide Scraps and Skins. M. Mulqueen (to Hatters Fur Exchange, Inc.). U.S.P.2,480,761 of 30/8/1949. Collagen and epithelial tissue are removed from animal fibres by digestion for about 24 hr. at about 40° C. with pepsin (0·1–1·0 per cent. strength) in a weak hydrochloric acid solution. The enzyme is inactivated by boiling for 5 min. The fibre is then rinsed and either scoured or dry-cleaned, and is claimed to be less damaged by this "stripping" process than by the usual boiling methods. W.

2—CONVERSION OF FIBRES INTO FINISHED YARNS

(A)—Preparatory Processes

Cotton Cleaning Apparatus. ("New Principle in Cleaning Cotton.") U.S. Department of Agriculture Cotton Ginning Laboratory. *Textile Industries*, 1950, **114**, No. 4, p. 119. A photograph and a section drawing are reproduced of a device for cleaning cotton that embodies a series of horizontal, keen-angled grid bars operating with any toothed or beater cylinder of a fibre cleaning apparatus, such as in a cotton gin stand, lint cleaner or mill cleaner. The grids are self-cleaning by virtue of their reciprocation in relation to the cylinders. The apparatus is designed to prevent the return of trash to the stream of clean lint. C—**2A.**

Opening Machine Magnetic Separators: Installation. ("Magnetic Separators Require Engineering.") Henry Hersey. *Textile Industries*, 1950, **114**, No. 4, 138-142. Types of permanent magnetic separators available for textile purposes (especially the detection of "tramp" metal) are described, *viz.* plate magnets, pneumatic line magnets, and magnetic pulleys. The installation of such separators in cotton opening machinery, cotton waste plant, and woollen mills is discussed and emphasis is laid on the correct choice of magnetic separator, and proper installation and working conditions. Various aspects of the use of magnetic separators are illustrated. C—**2A.**

"Quick Release" Condenser Trumpet. Platt Bros (Sales) Ltd. *Platt's Bulletin*, 1950, **7**, 11-12. A new condenser trumpet for cards, drawing frames and combers is made in two parts, which are quickly detachable, thus facilitating the speedy removal of sliver when choking occurs. The condenser trumpet is adaptable to all makes and types of machines. C—**2A.**

Multi-Draft Fly Frame Systems: Draft Equations. John Duerst. *Textile Industries*, 1950, **114**, No. 4, 168-170, 283, 285. Equations are derived for the calculation of drafts on modern multi-draft systems. They deal with the

questions (1) What is the "permissible" total draft for a multi-draft system if the count fed to the system is given? (2) What break draft would be correct for the calculated permissible total draft? (3) What relative break draft would be correct at a given total draft above or below the "permissible" draft? The use of the expressions is explained and a graphical method of finding total and intermediate drafts is given. C—**2A.**

Polyvinyl Chloride Drafting Roller Coatings. P. K. Kozlov. *Tekstil. prom.*, 1948, No. 1, 15-20 (through *Brit. Abstr.*, 1950, B II, 230). Details of construction and composition of polyvinyl chloride coatings for draw-frame rollers are given. The higher coefficient of friction of these coatings improves the efficiency of the drawing process. C—**2A.**

Cotton Waste: Utilisation. ("Die Abfallverwertung in der Aufbereitung der Baumwolle.") E. T. Kagan. *Kunstseide u. Zellwolle*, 1949, **27**, 451-453. The different types of cotton waste and their properties are briefly reviewed. Lint, fly and linters are the most valuable waste materials and a Russian machine for the opening and cleaning of lint is described and illustrated. C—**2A.**

Blowroom Machinery: Functions. ("Die Fertigungselemente der Spinnerei.") J. Schneider. *Kunstseide u. Zellwolle*, 1950, **28**, 44-53. The preparatory spinning processes are described, with drawings of the machines used, under the headings: (*a*) opening and cleaning, (*b*) carding, (*c*) combing, drawing, doubling, and (*d*) preparation of roving. Finally, spinning and twisting are considered very briefly. C—**2A.**

"Blumag" Magnetic Separators: Application in Extraction of Metals from Fibres. H. S. Greenwood & Sons Ltd. *Textile Weekly*, 1950, **45**, 1454-1456. An announcement is made of a new type of permanent magnet of very high coercive force for fitting into opening and cleaning machinery for the separation of scrap iron. C—**2A.**

"Fiber Meter" Automatic Blending System. ("How to Streamline Your Fiber Blending Operations.") W. F. Leineweber. *Rayon & Synth. Textiles*, 1950, **31**, No. 5, 59-61. The difficulties and drawbacks of the blending of fibres by hand are discussed. A mechanical method, the Fiber Meter Automatic Blending System, is described and illustrated. By this system the component fibres of the blend are weighed out automatically, and are passed by conveyor belt to a blending machine. C—**2A.**

Carding Engines: Development of Heat During Starting. A. Ochsner. *Bull. Oerlikon*, 1946, No. 261, 1716-1724 (through *Elec. Engng. Abstr.*, 1948, **51**, 233). From the data of a card drive with its motor, the effect of starting conditions on the heating of the motor is determined for two types of drive: (*a*) with chain or belt, without slip; (*b*) with slip coupling, with the slip torque between the motor and the card constant. The effect of the starting conditions on the thermal protection of the motor is also investigated. The starting losses and starting temperature rises in the motor windings, as well as the times of release of known trips for the assumed conditions of starting are summarised in a table for the two types of drive. C—**2A.**

Card-room Waste: Reduction. R. H. Pharr. *Textile World*, 1950, **100**, No. 5, 72-73. Hints are given for the control and reduction of cotton waste in the card-room. C—**2A.**

Vulcanised Fibre Card Sliver Cans: Manufacture. White, Child & Beney Ltd. *Textile Mercury & Argus*, 1950, **122**, 1026, 1030. *Textile Weekly*, 1950, **45**, 1584-88. A brief illustrated account is given of the production of sliver cans from "vulcanised fibre" composed of 10 to 12 layers of laminated paper and reinforced by cadmium-plated top and bottom rims. C—**2A.**

Sliver Lapper and Ribbon Lapper: Maintenance. *Whitin Review*, 1950, **17**, No. 1, 32-37. Brief illustrated instructions are given for the routine maintenance of the Whitin sliver lapper and the Whitin ribbon lapper. C—**2A.**

Wool Oiling: Evaluation and Development of Wool Oils. ("Problems in the Development of Efficient Woolen-Fiber Lubricants.") P. J. Martin. *Amer. Dyes. Rept.*, 1950, **39**, No. 7, 223-228. The factors to be considered in the evaluation of a wool oil are enumerated, and the progress of development of a wool oil is outlined. Experiments and apparatus designed to determine the combination of materials (mineral oil and emulsifier) which will give the optimum performance

in actual service are described. These include laboratory tests for emulsive properties, scourability, lubricity, effect on leather condenser tapes and aprons, resistance to discoloration, resistance to rancidity and autoxidation, antistatic properties, anti-corrosion properties, stability to freezing, and brightness. Subsequent mill-scale experiments carried out at Lowell Textile Institute in carding, spinning, weaving, wet finishing, and dyeing are described, and the performances of different oils are discussed. W—**2A.**

Blending of Raw Wool: Advances in Techniques. "Lanarius". *Canadian Text. J.*, 1950, **67**, No. 9, 64, 66. The methods of blending discussed include the Benoit and Platt systems, a fully automatic system of Proctor and Schwartz, and the Oddie-Radcliffe (continuous) system. In the first, the blend is prepared in batches, each constituent being weighed out accurately, and a mechanical oiling device producing a very fine oil dispersion is fitted to the feed lattice of the blending machine. Steam or electric heating of the tank for cold weather is advantageous. In the fully automatic system, the components of each blend are placed in a number of weighing feeds along the feed table of the super picker, which replaces the fearnought in the previous system. In the continuous woollen blending system described, the blend is deposited on an underground conveyor with extended rising lattice to the first hopper feed and then to the first opener. The stock is carried by means of conveyor fans, and a wool oiling device is incorporated. The blend is not oiled until all the blending is complete, so that oil is saved, the condition of the fearnought is improved, the blend is more open, and there is no possibility of the blend milling upon the fearnought. W—**2A.**

Wool: Continuous Blending. *Wool Record*, 1950, **77**, 1747-1748. The methods of blending very briefly described, include those of Benoit, Messrs. Proctor and Schwartz, Inc. (both semi-automatic and fully automatic), and the Oddie-Radcliffe, a British system. The Spencer-Halstead system is described in greater detail, and this includes an underground conveyor, which carries accurately weighed out lots of material to the first hopper feed. An extended rising lattice carries stock to the first opening machine, which may be a fearnought, plucker or shaker. A conveyor fan takes the material to the first centriblender. After passage through a second hopper feed, a second fan and centriblender, a third hopper feed and a second opener, oil is added to the wool, when it is in an ideal condition for the reception of the oil, and the material is open and lofty. The system is flexible, *e.g.* shoddy blends need not be put through the fearnought. The "Spenstead-Vortex" wool oiler working in conjunction with a Lister wool oiling machine thus adds finely dispersed oil accurately and evenly to well-opened wool without oil wastage so saving labour in cleaning and transporting. W—**2A.**

Oils: Use in Wool Processing; Quantities and Costs in Bygone Days. G. V. Carrette. *Wool Record*, 1950, **77**, 1899, 1923. A historical account of the different types of oils used in wool processing. Four books of historical interest are mentioned. W—**2A.**

Combing: Drawing-off on the Noble Comb. T. F. Griffin. *Text. Manufacturer*, 1950, **76**, 277-280. In the Noble comb the amount of draft used bears only an indirect relation to the thickness of the sliver leaving the comb compared with the sliver fed into the comb. It is explained that the draft imposed on the fibres when they are drawn off after passing the nip of the rollers is always one more than the calculated draft. The importance of the amount of draft used on the comb is pointed out. For satisfactory combing, the rollers must be run at a slightly higher surface speed than the circle. The fibres are not pulled forward in a straight line at the commencement of drawing-off and it is at this instant that the fibres are likely to be broken. Conditions are worse if the rollers are running fast. Other subjects discussed include effect of draft on tear, position of the drawing-off rollers, angle of fibre during drawing-off, wear on the leather, and other advantages of low draft. Some explanatory photographs are included. W—**2A.**

Uniform Oiling and Tinting. R. D. Robinson. *Text. World*, 1950, **100**, No. 6, 101, 188. A new method of applying fugitive tints or oil to fibres at the front of the pin drafter has been developed at Bachmann Uxbridge Worsted Corporation. A control-spray applies oil or tint by a low pressure nozzle, a fine spray covering the web in the oiling chamber, which simultaneously folds in the oil or tint as the fibres leave the unit. A list of suitable fugitive dyestuffs is given. W—**2A.**

Flax Spinning. Part II. Machinery and Equipment. Chap. IV. Hackling (*contd.*). A. V. Pringle. *Fibres, Fabrics & Cordage*, 1950, **17**, No. 3, 91-94; No. 4, 122-125. The Barbour system of arranging the pins is described. The brush and doffer method of cleaning hackles, the holders in which the material is held, the head and cross channels, corner motions, the screwing system, the draw-through mechanism for changing the position of flax in the holders, and the gearing of machines, are discussed. Calculations are given. The drive to sheets, the head motions, adjustment of the height of the lift, and Combe's head lever, are outlined briefly. Safety devices are described. **L—2A.**

Flax Spinning. Part II. Machinery and Equipment. Chap. IV. Hackling (*contd.*). A. V. Pringle. *Fibres, Fabrics & Cordage*, 1950, **17**, No. 5, 150-153. Adjustments and settings for new machines, or in re-checking old ones, are discussed. Two forms of ending devices, and up-draught and down-draught methods of dust-extraction are outlined. A roller shuttle type of cover is illustrated, which is easily run up for inspection purposes. Some information is given on turn-off, power consumption, floor space, end-cutters, dressing machines, automatic transferrers, tipple holders, and flax storage. **L—2A.**

The Mechanical Hackling of Flax Fibre. (1) Length of Strike. *Alphomega* (Fairbairn, Lawson, Combe Barbour Ltd.), 1950, No. 1, 8-11, 14. The factors which govern the efficiency of the mechanism of the hackling machine are stated to be (1) Maximum yield of fibre, (2) Minimum breakage of longer fibres, (3) Effective combing and splitting of fibres. A detailed account is given of the movement of the hackle pins relative to the flax during one complete cycle of operations. A diagram shows the amount of hackling during rise, dwell, and fall of the holders in actual practice. **L—2A.**

Decortication of Long Vegetable Fibre. S. A. G. Caldwell. *Textile Recorder*, 1950, **67**, April, 78-80. In mechanical treatment of bast fibre plants to extract and clean the fibre, a preliminary drying process is involved. The mangling process, and dryers of the Petrie & McNaught, and the Buttner type are described at length. A detailed account is given of the scutching of flax by Irish and Belgian wheels and by turbines. The decortication of jute and sunn hemp by hand stripping is outlined. The article concludes with a brief description of recent efforts to devise an efficient mechanical decorticator. **L—2A.**

(B)—Spinning and Doubling

Double-twist Uptwister Spindle. Fayolle et Cie. *Textile Weekly*, 1950, **45**, 1314. An illustration is given of a new adjustable spindle that can be fitted to the usual upstroke twisters and is claimed to run at speeds up to 10,000 r.p.m. for a low power consumption. **C—2B.**

Cotton Spinning Calculation Graphs. ("Spinning Calculations Simplified.") *Platt's Bulletin*, 1950, **7**, 13-18. In part 12 of this series calculation graphs are given (for ring spinning frames) for front roller speed and delivery rate for various spindle speeds and turns per inch; maximum spindle speeds when spinning with low turns per inch; traveller speeds for various ring diameters and spindle speeds; and bobbin sizes for various ring diameters and angles of lead. (For part 11 see *J. Textile Institute*, 1950, **41**, A344.) **C—2B.**

Ring Frame Tape Drives: Setting. Platt Bros. (Sales) Ltd. *Platt's Bulletin*, 1950, **7**, 6-11. Instructions are given for the setting and adjustment of tape drives on cotton ring spinning and doubling frames and wool ring spinning frames. Several diagrams are given to illustrate the points dealt with. **C—2B.**

Staple Fibre: Processing on Ring Spinning Frames. ("Die Ringspinnmaschine in der Kammgarnspinnerei und die Verarbeitung von Zellwolle auf der Ringspinnmaschine.") *Kunstseide u. Zellwolle*, 1949, **27**, 437-445. Factors important for an efficient production of staple fibre yarns on worsted ring frames is discussed, including spindle speed, number and causes of fibre breaks, atmospheric humidity and temperature, doffing times, work load and training of operatives. Causes of faults arising in the production of rovings are considered and faults that may occur on the ring-frame are dealt with in some detail. **C—2B.**

Cotton Yarn: Doubling. British Cotton Yarn Doubling Productivity Team. *Textile Weekly*, 1950, **45**, 1322-1324; *Textile Mercury & Argus*, 1950, **122**, 836a-838. References are made to the report issued by the Productivity Team

on their observations in October, 1949, of American practices in doubling. Recommendations for the consideration of British doublers are reproduced. C—**2B.**

Nylon Throwing Room: Importance of Air Conditioning. H. L. Kempaner. *Rayon & Synth. Textiles*, 1950, **31**, No. 5, 73-76. The objects and importance of air conditioning in the spinning and coning of nylon hosiery yarns are discussed with reference to practices in certain American mills. C—**2B.**

Parcofil Double-twist Spindle. *Textile Mercury & Argus*, 1950, **122**, 1023-1024. Illustrations are given of a double-twist spindle in which the stationary part that carries the delivery bobbin reposes on the spindle by means of two ball bearings, but is prevented from following the rotation of the spindle by powerful permanent magnets. C—**2B.**

Ring Spinning Frames: Automatic Speed Regulation. A. Jansö. *ASEA J.*, 1947, **30**, 19-38 (through *Elect. Engng. Abstr.*, 1947, **50**, 220). The running characteristics of ring spinning frames are described and a method is given for computing the required speed regulation. A variable-speed a.c. spinning motor and automatic spinning regulator are discussed, and directions are given for computing the regulator settings. C—**2B.**

Vulcascot Roller Cots and Drafting Aprons: Fitting. Vulcascot (Great Britain) Ltd. *Textile Weekly*, 1950, **45**, 1502-1504. An illustrated account is given of the production of Vulcascot (synthetic rubber) roller cots and high-draft aprons, and of a roller grinding machine. C—**2B.**

Centrifugal Spinning. H. Farnsworth. *Text. World*, 1950, **100**, No. 6, 116-7, 194, 196, 198, 200. The Prince-Smith and Stells P.S.C. centrifugal spinning and twisting systems are described. A speed of 16,000 r.p.m. has been achieved. In particular, reference is made to the method of dealing with an end breakage during spinning. W—**2B.**

Pneumafil System: Costs. ("Mill expects Pneumafil to return Cost within Year.") J. W. MacLeod. *Text. World*, 1950, **100**, No. 6, 111, 125. A brief description is given of the lowered manufacturing costs, improved yarn quality and increased production resulting from the first installation in Canada of the Pneumafil vacuum waste collection system on worsted spinning equipment. W—**2B.**

Worsted Ring Spinning: Use of the Spinning Limit (Optimum Spinning Speed). ("Ausnützung der Spinngrenze in der Kammgarn-Ringspinnerei.") R. Hofmeister. *Textil-Praxis*, 1950, **5**, 275. Recommendations are made for obtaining optimum production per spindle. The fibre breakages in a given spinning time are counted, and returned as breakages per spindle-minute. Experience has shown that the number of spindle revolutions can be increased till the fibre breakage reaches about 0·0075 per spindle-minute. Curves can be drawn showing the number of spindle revolutions giving a fibre breakage of 0·0075 per spindle-minute for the different yarn counts. These mean values serve as standards for various wool qualities when a new spinning batch is started. W—**2B.**

PATENTS

High-draft Mechanism. Douglas Fraser & Sons Ltd. and Hugh Fraser. B.P. 630,036 of 3/6/1947:4/10/1949. The device comprises a pair of retaining rollers, a pair of drafting rollers, a travelling apron (or upper and lower aprons) between these pairs of rollers, and a slipper member of inverted channel form for confining the fibre as it is carried by the apron(s). The mechanism is designed especially to overcome a defect described as "gulping" when drafting fibre of a wide range of staple length, such as jute. C.

Yarn Tube. American Paper Tube Co. B.P.630,039 of 16/6/1947:4/10/1949 (Conv. 26/7/1946). The claim is for a tube for warp yarn which is made by rolling and cementing together sheets of paper, slipping a ring of metal over the wide end and forming a head of plastic material in which the ring is embedded. C.

Sewing Cotton Packages. J. A. Grimshaw. B.P.630,185 of 19/3/1945:7/10/1949 and 630,186 of 25/4/1945:7/10/1949. The object of these inventions is to cheapen packages of sewing cotton (for India) by winding short lengths (*e.g.* 50 yards) on notched discs, polygonal cards or lens-shaped holders instead of wooden reels. The first invention covers mechanism for winding such packages and the second covers the holders themselves and the full packages. C.

Uptwister Spindle Swinging Device. Arundel, Coulthard & Co. Ltd. and Frank Pilkington. B.P.630,342 of 30/7/1947: 11/10/1949. The invention relates to lever and link mechanism for swinging each spindle of an uptwister clear of its driving belt and for arresting its motion. C.

Rectilinear Combing Machines. "Nouvelle Soc. de Construction, ci-devant N. Schlumberger & Cie.", S.A. B.P.636,735 of 3/5/1950. A rectilinear combing machine, which is particularly suitable for wool and flax, has both its upper and lower jaws pivotally mounted on a common fixed mounting; a circular comb is positioned underneath the lower jaw; both jaws have a rocking motion, the lower jaw being positively driven, and the upper jaw being resiliently driven by means of a lever connected with a spring. The lower jaw cannot engage the circular comb needles if overthicknesses are present in the feed lap, or if the rigid mechanism which drives the lower jaw breaks. W.

Wool and Other Threads: Apparatus for Straightening. F. B. Taylor and J. M. Spence. B.P.638,378 of 7/6/1950. The apparatus has a base with a groove for guiding the thread which is drawn along the groove while lightly gripped by a cover to develop tension; steam at atmospheric pressure is supplied to the groove through a conduit in the base of the apparatus. W.

Dabbing Brushes for Wool Combing Machines. T. Lorimer. B.P.638,757 of 14/6/1950. Means are provided for facilitating the mounting of a dabbing brush in position on the dabber foot. Securing bolts are combined with bolt-retaining means associated with a carrier element for the brush; bolt spacing is adjusted by moving the bolts and the bolt-retaining means. W.

3—CONVERSION OF YARNS INTO FABRICS

(A)—Preparatory Processes

Light Alloy Warp Beams. Richford Engineering Co. Ltd. *Brit. Rayon and Silk J.*, 1950, **26**, *April*, 76-77. Features of two types of light-alloy, adjustable-flange warp beams are described and illustrated. These beams, the "Sure Grip" and the "Fast Set", differ in the manner in which the flanges are adjusted. C—**3A.**

Barber-Colman Winding Machines. *Textile Weekly*, 1950, **45**, 1440-42, 1506-1508. Brief descriptions are given of the following Barber-Colman machines, with particulars of their yarn output: (1) Automatic spooler, (2) Super-speed warper (900 yd. per min.), (3) Warp tying machine, and (4) Warp drawing machine. C—**3A.**

Cross-wound Skeins: Reeling. ("Design Your Own Reeling Diamond Pattern.") R. M. Harbeck. *Textile World*, 1950, **100**, No. 5, 85, 324, 325. It is explained how various diamond patterns can be produced in skein reeling by variation of the traverse ratio. The calculation of traverse ratios is also explained. C—**3A.**

"Fidelity" Six-skein Reeler. ("Speeding Up Synthetic Yarn Reeling.") R. M. Harbeck. *Rayon & Synth. Textiles*, 1950, **31**, No. 5, 61-62. The use of the Fidelity six-skein, double-end artificial fibre yarn reeler is discussed. Relationships are given for the calculation of production, the number of reelers per operator, winding time, and length of skein. The production of diamond pattern skeins and the adjustment of the traversing mechanism are briefly considered. Five labour saving factors of this type of reeler are enumerated. C—**3A.**

Light-alloy Pirn and Bobbin Trays. ("Avoiding Yarn and Fabric Faults.") Messrs. Thompson "Textessories". *Textile Weekly*, 1950, **45**, 1568-1570. Illustrations are given of light-alloy trays for holding pirns, bobbins, cheeses and cones. They are provided with interlocking lugs by means of which they can be built up into stacks without rubbing the yarn. C—**3A.**

Low Voltage Static Eliminator. Chapman Electric Neutralizing Co. *Rayon & Synth. Textiles*, 1950, **31**, No. 5, 120. A new compact low-voltage static eliminator, Model LV, is announced. An illustration shows the device attached to a warper. C—**3A.**

"Universal" Winding Machines: New Developments. Universal Winding Co. *Textile Weekly*, 1950, **45**, 1346-48, 1394-96, 1438; and *Textile Mercury & Argus*, 1950, **122**, 846, 847, 863, 891-894. Brief illustrated descriptions are given of the following additions to the range of "Universal" yarn winding machines:

(1) The "Unifil" loom winder for winding bobbins for the magazine of an automatic bobbin-changing loom and stripping exhausted bobbins, at the loom itself. (2) The "Auto-coner" drum winder providing automatic supply bobbin transfer, automatic knot tying for each spindle and automatic regulation of the dimensions of the packages. (3) High-speed "Precision" winder with straight path for the yarn from the supply package to the guide at all diameters of the wound package, including "pineapple" cones. (4) The "Twister Coner" with double-twist spindle. (5) "Take-up" winding spindles, operating on the constant yarn speed principle with controlled yarn tension. (6) The "Unirail" uptwister with Atwood "Uniflex" spindle and vibration isolator. C—**3A.**

Winding for Automatic Weaving: Developments in Machinery. *Wool Record*, 1950, 77, 1921, 1923. The "Unifil" loom winder, which is applicable to all branches of the industry using automatic looms of the bobbin-changing, single-shuttle type, is described. The need for a weft winding room is eliminated, and the low winding speed safeguards weft quality. The Universal Auto-coner is a drum winder which provides automatic cone weft supply for the "Unifil" winder, and includes automatic knot-tying for each spindle, automatic control of size of wound packages, unit replacement of all parts, pressure cleaning of yarn tensions and slub-catcher devices, and partial waste removal. The method of operation of each is described and photographs are included. W—**3A.**

(B)—SIZING

Soluble Starch: Production. P. Islentiev. *Tekst. prom.*, 1948, No. 1, 43 (through *Brit. Abstr.*, 1950, B II, 243). Soluble starch for textile sizing and finishing is made by heating 240 kg. of maize starch with 8 kg. of 28 per cent. sodium bisulphate at 100°-108° C. for 4·5 hours. Recipes for sizing and finishing are given. C—**3B.**

Sizing Machines: Automatic Regulation. S. S. Shvyrev. *Tekstil. prom.*, 1947, 7, No. 5, 13-15 (through *Brit. Abstr.*, 1950, B I, 245). A dilatometric thermo regulator and a level regulator based on a similar principle are described. C—**3B.**

Tape Frame Drying Cylinder. Rigby and Mellor Ltd. *Textile Recorder*, 1950, 67, April, 83. *Textile Mercury & Argus*, 1950, 122, 975. *Textile Weekly*, 1950, 45, 1468-1470. A new drying cylinder for tape sizing machines contains an inner shell of corrugated metal so that an annular cavity about 3 inches deep around the face of the cylinder is formed. Steam circulates in this space, the volume of which is only a fraction of the total volume of the cylinder, *e.g.* 26 c. ft. against 140 c. ft. The consumption of steam is thus greatly reduced, but there is no loss in drying efficiency. The total weight of the new cylinder is no greater than that of the usual type. C—**3B.**

Size Mixing Nomogram. P. V. Seydel. *Textile Industries*, 1950, 114, No. 4, 172-173. A nomogram is given for the rapid solution of starch mixture calculations. Three scales give "pounds of starch", "ounces of starch per gallon", and "gallons of finished mixture", so that if any two of these quantities are known the third can be read off immediately. C—**3B.**

Starch Paste Fungicides. Shoichi Ohashi and Hideo Nakabayashi. *J. Agric. Chem. Soc. Japan*, 1949, 23, 107-110 (through *Chem. Abstr.*, 1950, 44, 3650^e). Starch paste for use in the textile industries should be mixed with antiseptics. Without the addition of antiseptics the order of putrefaction is wheat flour >crude corn starch, technical wheat starch>corn starch, potato starch, and sweet potato starch, the last three being very stable. Among four kinds of softening agents tested, zinc chloride prevented putrefaction in some degree, while Turkey red oil<calcium chloride<glycerol showed a little accelerating tendency to putrefaction of starch paste. The effects of *o*-chlorophenol, 2:4-dichlorophenol, 2:4-dichlorophenoxyacetic acid, 2:4:6-trichlorophenol, pentachlorophenol, 2-naphthol, phenol, formalin, and salicylic acid were compared in sweet potato starch and wheat flour. Chlorophenols were used in the form of their sodium salts. C—**3B.**

Warps: Sizing. Jens Jensen. *Tids. Textiltek.*, 1950, 8, 2-6 (through *Chem. Abstr.*, 1950, 44, 3718^e). A general discussion is given of sizing problems. The difficulties of obtaining a reliable expression for the effect of sizing are discussed. The effect of sizing must be measured by the number of warp breakages minus

the degree of usefulness of the good weave, which depends on other things than the yarn. The number of breakages alone must never be used as a basis for the evaluation of the quality of the sizing. **C—3B.**

(C)—WEAVING

Cidega Loom. ("Smallwares: No. 22.") A. Thompson and Sigfrid Bick. *Brit. Rayon and Silk J.*, 1950, **26**, April, 56-57. The Cidega loom for the production of smallwares is briefly described. Seven Cidega fabrics are described and illustrated. **C—3C.**

Courtaulds' Demonstration Factory, Bull Royd Mill: Equipment. ("Recent Developments in Rayon Staple/Wool Blends.") *Textile Recorder*, 1950, **67**, April, 76-77; *Silk and Rayon*, 1950, **24**, 438, 441. A brief illustrated account is given of the machinery installed in Courtaulds' new demonstration factory at Bull Royd Mill, Bradford, where rayon staple/wool fabrics are produced. **C—3C.**

Drop-box Conversion Unit for Single-shuttle Looms. George Keighley Ltd. *Brit. Rayon and Silk J.*, 1950, **26**, April, 78. A drop-box operating unit for the conversion of single-shuttle looms to drop-box machines is announced. The unit is available in two forms, for dobby control or for separate control by steel card chain mechanism. **C—3C.**

Loom Cut Meters. ("Renewed Interest in Cut Meters.") *Textile Industries*, 1950, **114**, No. 4, 127-129. A brief report is given of a survey to determine reasons for the use of cut meters in certain weaving mills. The cut meter may be wired up either to stop the loom, or to operate a signal light when the required length of material has been woven. It eliminates damage from cut marks and helps the weaver to meet the specification for length. **C—3C.**

Smallware Looms. T. F. Wilkinson and Co. Ltd. *Brit. Rayon and Silk J.*, 1950, **26**, April, 72-73, 75. Brief illustrated descriptions are given of a mock-space batten loom, a six tier batten loom, and a ladder-tape loom. **C—3C.**

Automatic Looms: Magazine Replenishment. ("Battery Fillers are Important People!") Wilmer Westbrook. *Textile Industries*, 1950, **114**, No. 4, 175, 177, 179. The rôle of battery filling operatives in the weaving shed is discussed and the importance of good training is stressed. **C—3C.**

Rubber-cored Weft Fabric: Weaving. T. F. Aguilar. French P. 946,826, from *Rev. Gén. Caout.*, 1950, **27**, 182 (through *Summary Current Lit., Res. Assoc. Brit. Rubber Mfrs.*, 1950, **28**, 327). In weaving a fabric with rubber-thread weft the tension of the elastic thread is adjusted so that the fabric has one or more areas tighter than the remainder, such fabric being suitable for making close-fitting girdles. **C—3C.**

Hattersley and Northrop Negative Dobby Shedding Motions. W. Middlebrook. *Textile Manufacturer*, 1950, **76**, 214-216. Brief illustrated descriptions are given of the Hattersley streamer and angle dobbies, the Hattersley patent heald machine, and the Northrop negative dobby. **C—3C.**

Hrdina Overpick Loom Pirn Changing Attachment. Czechoslovakia Metal and Engineering Works. *Textile Manufacturer*, 1950, **76**, 217-218. A brief illustrated description is given of the Hrdina pirn changing attachment for the conversion of non-automatic looms. Features include a large-capacity vertical magazine, telescopic shuttle feeler and electromagnetic change motion. **C—3C.**

Loom Reed Motions. I. Laird. *Textile Manufacturer*, 1950, **76**, 231-233. Methods are briefly described of fitting reeds to looms to prevent accidental damage to reed or shuttle. Loose-reed and fast-reed motions are explained and the "bang-off" mechanism of the latter type is described. **C—3C.**

Weft Insertion Mechanism. D. C. Snowden. *Fibres*, 1950, **11**, 168-171. Some methods for the insertion of weft picks are briefly reviewed. Picking mechanisms used in conjunction with the conventional shuttle are considered—the usual picking stick, electromagnetic methods, and pneumatic methods. Rapier looms, where the weft (supplied from a stationary source) is inserted by means of long arms or "rapiers", are mentioned, and the picking process is illustrated. Finally, the carrier method of weft insertion (developed in Switzerland and the U.S.A.) is dealt with. Here weft, unwound from a cone at the side of the loom, is carried across the warp sheet by means of small metal carriers. **C—3C.**

Leno Fabrics: Weaving. J. H. Strong. *Textile Mercury & Argus*, 1950, **122**, 1062-1065. Some variations in leno weaving with one doup are described with the help of diagrams. C—**3C.**

Carpets and Rugs: History and Manufacturing Methods. H. B. Morris. *Canadian Text. J.*, 1950, **67**, No. 11, 57-58. Mechanical developments in the history of rugs and carpets are outlined. Carpet wools are usually in a range between 36s and 46s qualities, and methods of blending, scouring and dyeing are discussed. The types of weaving described are Spool Axminster, Wilton, Tapestry or Velvet, and Gripper Jacquard Axminster. W—**3C.**

(D)—KNITTING

Latch Needle Rib Knitting Machine Needle Detector. J. H. Blore. *Textile Industries*, 1950, **114**, No. 4, 231-233. Constructional details are given for a needle detector for latch needle rib machines. The device is wired up to the electric stop motion. A broken needle, large slub, loose fabric, broken butt, or other damage causes the detector to stop the machine. C—**3D.**

Hosiery Yarns: Desirable Properties. A. W. Eley. *Brit. Rayon and Silk J.*, 1950, **26**, April, 70. Summary of a lecture. The properties of the "ideal" hosiery yarn include suppleness and pliability, porosity, warmth, high wet and dry strength, regularity, and high tenacity. C—**3D.**

Perlon Fibre: Application in the Hosiery Industry. ("Perlonseide und Perlonfaser in der Strumpfindustrie." Walter Pelz. *Kunstseide u. Zellwolle*, 1949, **27**, 368-371. After a brief comparison of the physical properties of Perlon and other textile fibres, the production of hosiery from Perlon fibres is discussed. Results of wear tests are presented and the possibility of using Perlon for strengthening heels and toes is considered. Good results have been achieved by the use of Perlon mixture yarns in the production of men's half-hose. C—**3D.**

Circular Knitting Machine for Cardigans. ("Die Herstellung von Noppenmustern auf Rundstrickmaschinen.") *Textilberichte*, 1949, **30**, 453. Reference is made to a circular knitting frame that has four different kinds of needles and specially designed cam parts, and permits great variations in the production of circular knitted fabrics of the cardigan type. C—**3D.**

Men's Hosiery: Construction. J. B. Lancashire. *Brit. Rayon and Silk J.*, 1950, **26**, May, 64-65. Some modern developments in the manufacture of men's hosiery include the manufacture of half-hose with solid designs ("Argyles"), the production of elastic-topped hose on single-cylinder automatic and double-cylinder machines, and the production of fancy half-hose. Diagrams of stitch constructions are reproduced. C—**3D.**

Warp Knitted Fabrics: Structure and Production. ("Warp Knitting Technology.") D. F. Paling. *Brit. Rayon & Silk J.*, 1950, **26**, March, 48-50; April, 52-54, 99; May, 55-57. The basic principles of warp knitting are dealt with. The structure of a simple warp knitted fabric is described, together with some of the associated technical terms. With the aid of diagrams the knitting action of a typical modern machine is explained. Factors influencing the structure of a warp knitted fabric are outlined. The movements of the needle bar, sinker bar, presser, and guide bar (swinging and shogging motion) are described. The main factors controlling quality during knitting are the rate at which the fabric is drawn away from the needles, and the amount of tension applied to the warp threads. Take-up and let-off motions are discussed. C—**3D.**

(G)—FABRICS

Nylon: Incorporation in Papermakers' Felts. E. A. Rees and Harold Dahlberg. *Paper Trade J.*, 1950, **130**, No. 18, 21-25. The properties of wool and nylon are reviewed and data are given for tensile strength, elongation and elasticity of these fibres. The possibility of blending the two fibres to obtain products of different physical properties is considered. Incorporation of nylon in papermakers' felts increases the strength, wearing quality and resistance to chemical and microbiological attack. C—**3G.**

Striped and Check Fabrics: Construction. A. T. C. Robinson. *Silk & Rayon*, 1950, **24**, 656, 658, 661. The design and production of simple stripes and checks are described and the following are dealt with: check taffeta, fancy yarn stripes, satin stripes on crêpe-de-Chine, striped honeycomb, dyed-yarn stripe on moss crêpe weave, laminette stripe on satin, laminette check for suitings, colour and

weave design with overcheck, and checked sheer crêpe. Samples of each of these constructions are illustrated. C—**3G.**

Cloqué Fabrics: Production on Dobby Looms. ("Die Grossmusterung von Cloquégeweben auf Schaftstühlen.") Hans Keller. *Textil-Rundschau*, 1950, **5**, 58-60. An illustrated description is given of the production of cloqué fabrics with simple and with large patterns on box looms with 20 shafts. C—**3G.**

Maori Textiles: Production Techniques. ("Textile Techniken der Maori.") W. G. Fischel. *Ciba-Rundschau*, 1950, No. 90, 3337-3340, 3343-3345. An illustrated account is given of the textile arts practised by the Maoris of Polynesia and New Zealand, including braiding, processing of flax fibres, production of items of clothing, the Taniko technique (production of ornamental borders), and methods of dyeing (particularly black, red, yellow, and blue). C—**3G.**

North American Indian Textiles. ("Textilkunst der Indianer Nordamerikas.") A. Latour. *Ciba-Rundschau*, 1949, No. 87, 3235-3239, 3241-3248. Illustrated descriptions are given of ornamented textiles produced by American Indians and of the art of braiding, weaving and embroidery as practised by the primitive Indians. C—**3G.**

Nylon Fabrics: Development. Carl Taber. *Rayon & Synth. Textiles*, 1950, **31**, No. 5, 87-89. A report of a lecture in which a brief survey is given of the development of nylon fabrics. Aspects mentioned include developments in fully-fashioned hosiery, nylon tricot fabrics, nylon sizing, nylon staple, versatility of nylon, heat setting, and ways in which nylon is used in fabrics. C—**3G.**

Rayon Fabrics: Properties and Uses. ("The Place of Rayon in Textile Progress.") A. R. Urquhart. *J. Textile Institute*, 1950, **41**, 137-147. The properties and uses of various types of natural- and synthetic-polymer rayon fabrics are discussed. C—**3G.**

Sixteenth Century British Textile Industry. ("Das Textilgewerbe unter Königin Elisabeth.") H. Wescher. *Ciba-Rundschau*, 1949, No. 88, 3276-3281; *Ciba-Review*, 1950, No. 78, 2858-2862. An illustrated account is given of the development of the English textile industry during the 16th century. The Elizabethan period saw the rapid development of the woollen industry, the foundation of the first English carpet manufacture, and the beginning of the hosiery industry (Lee's "stocking loom"). C—**3G.**

PATENTS

Automatic Loom Bobbin Magazine. Rudolf Hrdina. B.P.629,615 of 20/11/1946: 23/9/1949 (Conv. 7/12/1945). The individual ends of the bobbins in the magazine of an automatic bobbin-changing loom are guided over a distant curved wire (*a*) to a securing means (*b*), and (*a*) or (*b*) is adapted to be moved toward the magazine for slackening the ends during the bobbin exchange operation or retracted to bring them under tension. The securing device (*b*) is a bobbin fixed on a two-armed lever mounted on a pin that carries the guide (*a*) and is made to swing by mechanism, including a draw-rod, plunger and bell-crank lever when actuated by the bobbin-transfer mechanism. C.

Dialkyl *o*-phosphate Anti-static Dressing: Application. General Aniline & Film Corporation (assignees of A. L. Fox). B.P.629,659 of 3/10/1946: 26/9/1949 (Conv. 6/12/1945). The claim is for textile materials (fibres, filaments, yarns, *etc.*) that have been rendered anti-static by dressing with a textile lubricating oil (mineral or olive oil) containing 0·1 to 10 per cent. of a dialkyl *o*-phosphate of the type of ethyl lauryl *o*-phosphate. The first example refers to dressing cellulose acetate yarn by running it over a submerged wick so as to add about 2 per cent. of the oil. The second example refers to an emulsion, of which 4 per cent. is added. The third example refers to the addition of about 0·5 per cent. of the dressing to a cotton yarn for weaving. C.

Circular Knitting Machine Wrap Yarn Carriers Shogging Mechanism. E. P. Newton (for Scott & Williams Inc.). B.P.630,008 of 2/1/1946: 4/10/1949. The invention relates to independent shogging mechanism whereby embroidery designs are produced by the shogging of wrap yarn fingers in two or more groups through substantial angular ranges with respect to the needles. The details are shown in 14 sheets of machine drawings. C.

Warp Leasing Device. Koefod, Hauberg, Marstrand og Helweg, Aktieselskabet Titan. B.P.630,067 of 12/10/1945: 5/10/1949 (Conv. 17/1/1944). The claim

is for a warp leasing arrangement in which the threads are crossed by means of pliable lease members made of wire, cabled wire or metallic band, and in which the threads are separated, singly or in groups, by means of a cross picker with oscillatory gripping members. C.

Flat Knitting Machine Set-up Combs. W. & J. Foster Ltd. and J. F. Humphreys. B.P.630,151 of 11/1/1947:6/10/1949. The teeth of a set-up comb for a flat knitting machine for knitting outerwear are formed of pieces of half-round wire each bent upon itself so as to leave an eye at the bend. The pieces are soldered to the comb body while the open eyes are aligned by threading them with a wire. C.

Straight-bar Knitting Machine Draw Mechanism. Mellor Bromley & Co. Ltd. and S. A. Mouk. B.P.630,249 of 8/3/1946:10/10/1949. Draw mechanism for a straight-bar machine (*e.g.* Cotton's patent) comprises an endless flexible driving element, guided for travel in two parallel but opposite runs, means for displacing the guides so as to vary the length of the two runs, and a reciprocable driving member coupled to the flexible element for travelling in the runs alternately. C.

Fabric Marking-out Machine. Aage Rothenborg. B.P.630,354 of 22/9/1947:11/10/1949 (Conv. 20/9/1946). The invention relates to a machine for marking out a pile of fabric by plunging a needle fed with a coloured pigment through the layers. To ensure that sufficient pigment is left in the lower layers, the needle is provided with a helical groove for the pigment and is rotated as the needle is depressed so that pigment is forced out of the container. The machine resembles a sewing machine in form and the needle is rotated by a drive from a motor housed in the framework, the motor being switched on as the hand lever for depressing the needle is worked. C.

Loom Driving Motor Control Mechanism. James Ainsworth. B.P.630,401 of 12/9/1947:12/10/1949. The claim is for a robust device for using a loom starting-on handle to close an electric switch to start the driving motor, and means for preventing the accidental start of the loom if the main current comes on after failure with the handle in the operative position. The mechanism comprises a multi-pole switch operated by a spindle linked to the setting-on handle, and a contactor the operating coil of which is in series with one of the switch contacts to prevent re-energisation of the contactor on restoration of the power supply if the switch has not been moved from the operative position. C.

Warper's Bobbin. British Celanese Ltd. B.P.630,457 of 27/5/1947:13/10/1949 (Conv. 31/5/1946). The claim is for a combination of a hollow, thin-walled barrel that tapers gently towards the top over most of its length and is flared out to a skirt at the lower end, means for receiving a magazine wrap or transfer tail, and a mount that makes a frictional grip on the interior of the barrel and can be fixed to a winding spindle where required. C.

4—CHEMICAL AND FINISHING PROCESSES

(A)—Preparatory Processes

Sized Viscose Fibre: Hypochlorite Treatment. S. Klyucharev. *Tekstil. prom.*, 1948, **8**, No. 3, 26-28 (through *Chem. Abstr.*, 1950, **44**, 3262[8]). Immersion of the fibre in a cold alkaline solution of sodium hypochlorite (containing 2 gm./litre sodium carbonate, 2 gm./litre wetting agent NB, and 2 gm./litre active chlorine as NaOCl) is followed by cooking in a hot alkaline solution (2 gm./litre caustic soda, 2 gm./litre cryst. Na_3 phosphate, and 2 gm./litre sodium ricinoleate). C—**4A.**

(B)—Boiling, Scouring, Degumming and Washing

"Flexreel" Scouring Unit. ("Fabric Processed Without Tension in Rope or Open-width Form.") James Hunter Machine Co. *Textile World*, 1950, **100**, No. 5, 111. In a new machine (known as the "Flexreel") for the tensionless scouring of fabrics in rope or open-width form cloth is conveyed by means of multiple reels, each of which acts as an individual variable-speed drive and automatically keeps the cloth tensionless. The machine is made entirely of stainless steel. C—**4B.**

(E)—Drying and Conditioning

Suction Moisture Extractor. Sir James Farmer Norton & Co. Ltd. *Brit. Rayon and Silk J.*, 1950, **26**, April, 74-75; *Textile Recorder*, 1950, **67**, April,

84-85. The main details of a new open-width suction extractor are outlined. A feature is a two-point suction which enables uniform and effective removal of moisture. Illustrations are given. C—**4E.**

Yarn Packages: Drying. E. Honegger and C. Bellenot. *Schweiz. Bauztg.*, 1945, **125**, 205-209 (through *Elec. Engng. Abstr.*, 1946, **59**, 117.) Data for the absorption and desorption equilibrium curves of various textile materials exposed at different humidities and temperatures are reviewed and heating and dimensional changes accompanying changes in moisture content are considered. A theoretical treatment for the drying of spools of yarn reveals the advantage of using warm air supplied under pressure to the hollow centre of the spool so that it passes outward through the drying yarn. The use of this method to replace that in which the air current passes around the exterior of the spool reduces the drying time from 120 to 3 hours and from 60 to 2½ hours for two types of spools. C—**4E.**

(G)—BLEACHING

Rayon and Staple Fibre: Bleaching by Sodium Chlorite. ("Über die praktische Anwendung von Natriumchlorit in der Bleiche von Kunstseide und Zellwolle.") Werner Popp. *Kunstseide u. Zellwolle*, 1949, **27**, 349-351. The use of sodium chlorite for the bleaching of rayon and staple fibre is to be preferred to hypochlorite and peroxide methods because it largely eliminates fibre damage and may be applied in continuous processes. Practical working conditions are discussed and instructions for the application of sodium chlorite in continuous and discontinuous bleaching processes are given. C—**4G.**

(H)—MERCERISING

Jute: Mercerisation. R. R. Mukherjee and H. J. Woods. *Nature*, 1950, **165**, 818-819. A study has been made of "soda-cellulose" obtained by treating raw jute without tension in caustic soda solutions of various concentrations. In general the native modification was absent for concentrations greater than about 10 per cent., but it reappeared when the alkali was removed by washing in water. Therefore in jute incomplete transformation to cellulose hydrate was not due to the failure of the alkali to penetrate into the cellulose crystallites but to at least partial reversibility of the native→soda-cellulose reaction. The difference in behaviour of jute and ramie during mercerisation is ascribed to the effect of lignin in the former. C—**4H.**

(I)—DYEING

Dyes: Light Absorption and Fading. Suco Sakurai. *Rept. Japan Assoc. Advancement Sci.*, 1942, **16**, 547-548 (through *Chem. Abstr.*, 1950, **44**, 2753[h]). Dyes whose light absorption curves dip deeply fade easily in light and dyes with shallow absorption curves are resistant to light. Hence the absorption curves can be used as a measure of resistance of dyes to light. C—**4I.**

Dyes: Standardisation. R. W. Shackleton. *J. Soc. Dyers & Col.*, 1950, **66**, 221-224. The problems which arise in the standardisation of dyes are considered under control of (i) physical, (ii) chemical, and (iii) tinctorial properties. The technique of standardisation is discussed. The three essential operations are: establishment of a standard, assessment of batch material prior to final standardising operation, and conversion of batch material to marketable dye. C—**4I.**

Laboratory High-temperature Continuous Dyeing Machine. ("Some Practical Aspects of High-Temperature Dyeing.") R. D. Robinson and C. L. Zimmerman (Bachmann Uxbridge Worsted Corporation). *Amer. Dyes. Rept.*, 1950, **39**, 250-256. Investigations on continuous dyeing at temperatures above 212° F. are described. The development of this process from the laboratory scale to the commercial "Uxbridge" high temperature dyeing machine is traced. The latter machine is briefly described. When dyeing is carried out at high temperatures (under pressure) dyeing time is greatly reduced and other favourable features (*e.g.* of fastness and tensile strength) are achieved. These properties are discussed. Photographs of apparatus and of cross sections of wool dyed at various temperatures and for different periods of time are shown. C—**4I.**

"Standfast" Dyeing Process. Standfast Dyers and Printers Ltd. *Silk & Rayon*, 1950, **24**, 575-576, 578. Details of the "Standfast metal machine continuous vat dyeing process" are given. The construction of the machine and its mode of operation are described and illustrated. C—**4I.**

"Standfast" High Speed Vat Dyeing Process. G. L. Boardman (Standfast Dyers and Printers Ltd.) *Brit. Rayon and Silk J.*, 1950, **26**, April, 68-69. A report of a lecture. The "Standfast" process of high speed vat dyeing is described. The principal feature is the use of molten metal as the medium in which fixation of the colour occurs. C—**41.**

Aniline Black Dye Bath: Elimination of Free Aniline. B. V. Ponomarenko and A. V. Lebedev. *Tekstil. prom.*, 1948, No. 3, 23-26 (through *Brit. Abstr.*, 1950, B II, 241). A laboratory study of the hydrolysis of aniline hydrochloride in the presence of sodium ferrocyanide during drying on fabrics is described. The volatility of free aniline depends on the amount of it in the original formulation and on the hydrolysis of the hydrochloride, both free and combined aniline being volatilised. Lowering the content of free aniline in the bath results in increased volatility at the expense of aniline hydrochloride which is then hydrolysed to a greater extent. The addition of not more than 5 per cent. of free aniline to the dyebath is recommended. C—**41.**

Animalised Cellulose Fibres: Dyeing with Acid Wool Dyes. ("Zur Kenntnis der Anfärbbarkeit animalisierter Zellulosefasern mit sauren Wollfarbstoffen.") P. Eckert and R. Abend. *Kunstseide u. Zellwolle*, 1949, **27**, 385-395, 431-436. Rayon animalised with a mixed resin of phenol, urea, formaldehyde, glycerin and phthalic acid was dyed with Ponceau 5R and compared with wool. The dyeing characteristics of both fibres are largely dependent on the conditions, and the influences of *pH*, amount of animalising resin, dye concentration, and temperature are shown in graphs and tables. Similar series of experiments were carried out with Brillantcrocein extra conc., a diazo dye analogous to Ponceau 5R, but having two instead of three sulphonic acid groups. In the first minutes of the dyeing process the rate of absorption of Brillantcrocein by both fibres is greater than that of Ponceau 5R in the presence of sulphuric acid and smaller than that of Ponceau 5R in a neutral medium. Total absorption, however, is smaller in both cases for the former dye than for the latter. This difference gradually decreases for animalised staple fibre with increasing initial *pH* and increasing vat ratio, whereas it increases for wool with increasing initial *pH*, but decreasing vat ratio. C—**41.**

Mercerised Cotton Fibre: Dyeing. A. T. Belous and L. V. Vedenina. *Tekstil. prom.*, 1947, No. 10, 39-40 (through *Brit. Abstr.*, 1950, B II, 240). The effect of variations of caustic soda concentration in mercerisation on dyeing behaviour was studied. Concentrations of 150 gm. of caustic soda per litre at not more than 20° C. are taken as normal for subsequent azoic, vat, and sulphur dyeing; for basic dyes, 250 gm. per litre below 40° C., and for direct dyes, 200 gm. per litre below 20° C. are normal. Mercerisation increases the depth of shade five-fold for azoic, three- to five-fold for basic, three-fold for vat and direct, and two-fold for sulphur dyes. C—**41.**

Sulphur Dyes: Continuous Dyeing on Cotton. V. E. Rostovtsev and S. A. Plaksin. *Tekstil. prom.*, 1948, **8**, No. 4, 24-26 (through *Chem. Abstr.*, 1950, **44**, 3259^{h}). Fibres are exposed alternately to the dyebath and to steam. This permits a considerable decrease in the volume of the dyebath without decreasing the strength or intensity of the colour. The immersion-steaming method consists of one or two immersions at 75°-80° C. followed by steaming at 100° C. for 30-60 secs., and then by a wash. C—**41.**

Coprantine Dyes: Development. ("Wesen und Entstehung der Coprantinfarbstoffe.") *Ciba-Rundschau*, 1949, No. 88, 3283-3285. The development of coprantine dyes (azo dyes that form copper complexes) is briefly outlined. C—**41.**

Continuous Dyeing Ranges: Application for Rayon Fabrics. ("Continuous Ranges Proved for Dyeing Synthetics.") F. A. Alter. *Textile World*, 1950, **100**, No. 5, 105. A continuous-dyeing unit for rayon fabrics is briefly described; it can be used for a wide range of dyes. C—**41.**

Hosiery Dyeing Plant Extractor: Application. ("One Extractor Does Work of Four.") O. O. Scott and Raymond Vaughan. *Textile World*, 1950, **100**, No. 5, 94, 312, 314. By putting in one new extractor in place of four older ones an American dyehouse has saved time, labour and floor space in the dyeing of socks. The goods are handled by means of an electric hoist. C—**41.**

Acetate/Viscose Rayon Blends: Effect of Variation on Dyeing. ("Stop Streaky Dyeing before it Happens.") Harry New. *Textile World*, 1950, **100**, No. 5, 86-87. The effect of variations in viscose/cellulose acetate blends on the levelness of dyeing has been investigated. Knitted and woven fabrics made from the blended yarns were dyed and it was found that a 3 per cent. variation in the blend produced unsatisfactory dyeing. Pad-dyeing and also the plying of yarns tend to reduce the unlevel dyeing. C—**41.**

Acetate/Viscose Rayon Fabrics: Reserve Dyeing. ("Färben von Acetatkunstseidengeweben mit weissen Effekten aus Viskosekunstseide.") W. Müller. *Ciba-Rundschau*, 1949, No. 87, 3251-3253. The prevention of faults is discussed in the production of two-colour effects on acetate/viscose mixture fabrics, in which the acetate rayon is dyed in dark shades whereas the viscose rayon should remain white. The most suitable cleaning methods for all Cibacet dyes are summarised in a table. C—**41.**

Artificial Filament Yarns: Package Dyeing. H. F. C. Wilcox. *Rayon & Synth. Textiles*, 1950, **31**, No. 5, 90. Twelve points are listed to demonstrate the advantages of package dyeing over skein dyeing for artificial filament yarns. C—**41.**

Nylon Fabrics: American Finishing and Dyeing Methods. ("Veredlung von Nylongeweben in den U.S.A.") F. Schläppi. *Textil-Rundschau*, 1950, **5**, 135-141, 201. Methods used in the United States for the setting of nylon at elevated temperatures, scouring, and dyeing are described. Tables showing the deniers of commercial nylon yarns, the breaking load of nylon as compared with other fibres, the effect of sunlight exposure on nylon and other fibres, shrinkage of nylon in water and steam, nylon solvents, and identification of nylon in mixture fabrics are reproduced from other publications. C—**41.**

Dyes: Absorption Curves. ("Aufziehkurven.") F. Schütz. *Ciba-Rundschau*, 1950, No. 89, 3315-3317; *Textil-Rundschau*, 1950, **5**, 203-205. Absorption curves have been plotted for Chlorantine Fast and Coprantine dyes (for dyeings in the presence of sodium sulphate, dyeings in which Na_2SO_4 is added after half an hour, and for combination dyeings) which permit a full characterisation of the dye for all practical purposes. C—**41.**

Dyed Nylon Fabric: Effect of Heat Setting. *Techn. Bull. (du Pont)*, 1949, **5**, 167-189. The stability to heat-setting of du Pont acid, direct, chromacyl, and chrome dyes, as well as acetate and developed acetate dyes, has been tested on nylon fabric. Samples were subjected to a highly exaggerated heat treatment, the period of exposure being from 15 to 20 times as long as the mill procedure. The tabulated fastness results indicate that most of the tested dyes can be recommended for industrial application where dry heat is used. C—**41.**

Vat Dyes: Transfer Properties. *Techn. Bull. (du Pont)*, 1949, **5**, 209-210. The "specific transfer percentage" of each du Pont vat dye has been determined at different temperatures. Dyeings were made on unbleached, unmercerised, scoured cotton yarn and on bright filament viscose rayon. The tabulated results show that vat dyes have much better transfer properties on cotton than on rayon and on both fibres the degree of transference is greater at the higher temperature. C—**41.**

Vicara/Wool Unions: Dyeing. *Techn. Bull. (du Pont)*, 1949, **5**, 192-199. The dye receptivity of a mixture of 50 per cent. Vicara staple fibre (from corn protein) and 50 per cent. scoured wool was investigated for acid, chromacyl, chrome, direct, and vat colours. Each of these wool colours dyed both Vicara and wool but a good union was not always obtained. Tables are given showing the relative strengths of wool dyes on the Vicara component, and the "union" produced by each dye is graded. C—**41.**

Wool: Rôle of the Electrical Double Layer in the Sorption of Acids and Dyes. P. Alexander and J. A. Kitchener. *Text. Res. J.*, 1950, **20**, 203-214. The phenomena associated with the sorption of acids and dyes by wool are explained in terms of the recognised properties of an electrical double layer. The process of sorption of acids and dyes is analogous to the adsorption of electrolytes by inorganic colloids, and the work of Kruyt is cited. Some differences between soluble and insoluble proteins, especially those relating to the location of polar groups in fibrous proteins, are discussed. Dyes are taken up either as gegenions

to the charged groupings within the fibres or as leading ions bound by non-Coulombic forces and carrying inorganic gegenions with them into the fibre. The effect of salts and acids on dyeing equilibria can be formulated by means of the law of mass action used in conjunction with the appropriate adsorption isotherm. The theory of Gilbert and Rideal is discussed. W—**41.**

Harris Color Stripping Process. M. D. Ewing. *Text. Industries*, 1950, **114**, No. 6, 99-100. The wool is first treated with ethylene dibromide in alkaline solution when the vulnerable disulphide link is replaced by a stable linkage. The material may then be subjected to rigorous stripping action without further damage. Little or no equipment modification and no additional instruments are necessary. The protected fibres are less vulnerable to the destructive effects of dyeing and scouring than the virgin wool with which they are used. The product is firm, strong and resilient and, although the difference is less apparent when oils or softening agents are applied, it again becomes obvious on redyeing or further processing. No damage to acid-dyed wool after "Harristrip" can be detected by the alkali-solubility test and the strength of the fibres is unimpaired. "Harristrip" wool has the same affinity for dyes as untreated wool. The process has its limitations, since it cannot remove many dyes which are generally considered to be unstrippable, *e.g.* chrome black. W—**41.**

Dyeing of Piece Goods made from Reclaimed Fibres. E. Smith. *J. Textile Institute*, 1950, **41**, P208-P218. Qualitative and quantitative tests for the identification and estimation of the constituents of piece goods made from uncarbonised reclaimed fibres are described. Methods for removing materials which will not dye with wool dyes are mentioned. Some investigations into the dyeing of nylon/wool unions are described, and suitable dyes are suggested. The formaldehyde sulphoxylate and acetic acid process is recommended for stripping. W—**41.**

(J)—PRINTING

Defective Rayon Prints: Causes and Remedies. ("Roller Printing Difficulties.") *Brit. Rayon and Silk J.*, 1950, **26**, April, 60-62. Troubles encountered in roller printing (particularly with modern rayon fabrics) are discussed. Sources of defects include foreign matter in the print paste or on the doctor blade, the creasing of crêpe fabrics, excess print paste on the fabric, careless steaming, the formation of soap scums through hard water rinsing, and the reduction of indigoid dyes during steaming. (See also *J. Textile Institute*, 1949, **40**, A511.) C—**4J.**

Vegetable Mucilages: Application in Screen and Hand Block Printing. *Textile Recorder*, 1950, **67**, May, 85-87. The use of locust bean and tragacanth thickenings in screen and hand block printing is discussed with respect to the following groups of dye: stabilised azoics and leuco-esters of vat dyes, chrome mordant dyes, cellulose acetate dyes, and acid and direct dyes (by the urea process). C—**4J.**

Roller Printing Machine Doctor Blade: Adjustment. *Dyer*, 1950, **103**, 743-745. A brief account is given of methods of adjusting and of improving the efficiency of the various types of doctor blades used in roller printing. C—**4J.**

Screen Printing Mechanism. ("Der Filmdruck und seine Mechanisierung.") Joachim Clauss. *Textilberichte*, 1949, **30**, 472-474. A lecture. Ten mechanised screen printing processes are mentioned, three of which (Josef Kessel, Franz Zimmers Erben, and Hickisch-Wilsch) are widely used. Characteristics of the various machines are reviewed. C—**4J.**

"Teximpex" Screen-printing Machine. Cheskova Ltd. (Bolton). *Textile Manufacturer*, 1950, **76**, 246. Brief details are given of a new Swedish semi-automatic screen printing machine known as the "Teximpex". (See also *J. Textile Institute*, 1950, **41**, A356.) C—**4J.**

(K)—FINISHING

Soil-resistant Cotton Cloth: Production. W. P. Utermohlen. *Amer. Dyes. Rept.*, 1950, **39**, 262-264. The author has studied the effect of a number of treatments on the ease of soiling of cotton cloth and on the ease of removal of dirt by washing. Of the treatments employed, those which alter the electrical charge on the cloth by introducing acidic groups appeared to be most favourable. Partial acetylation was particularly effective in increasing resistance to dry soiling. C—**4K.**

Cloth Finishing Machinery: Principles and Development. K. S. Laurie. *J. Soc. Dyers & Col.*, 1950, **66**, 225-229. A report of a "refresher course" lecture. An account is given of the principles underlying the design and development of machinery for the dyeing and drying of cloth. The application of electronics in the control of finishing machinery is discussed. **C—4K.**

Amide-Formaldehyde Resins: Application in Finishing; Rôle of Catalysts and Stabilisers. ("Zur Frage der Katalysatoren und Stabilisatoren in der Textilveredlung mit Amid-Formaldehyde-Kondensationsprodukten.") G. Sulzer. *Textil-Rundschau*, 1950, **5**, 144-147. Catalytic processes applied in the production or urea- or melamine-formaldehyde resins for textile finishing are reviewed. Disadvantages of using ammonia as stabilisers for finishing baths containing resins and ammonium salts as hardening catalysts are pointed out. The new "Catalyser A" manufactured by Ciba is briefly described; it yields the H-ions required for hardening, but does not contain ammonium salts or substances that could lead to the formation of methylamine, nor does it reduce the lightfastness of dyeings. **C—4K.**

"Calpreta" Permanently-glazed and Shrink-resistant Fabrics. Calico Printers' Association Ltd. *Textile Mercury & Argus*, 1950, **122**, 977-978. An announcement is made of the introduction of a range of fabrics (especially crêpes) characterised as permanently glazed and unshrinkable. **C—4K.**

Shrink-resist Finishing Processes: Development. ("Fortschritte auf dem Gebiet der schrumpffreien Ausrüstung.") Paul Wengraf. *Textil-Rundschau*, 1950, **5**, 49-58, 98. Shrink-resistant finishing treatments for (*a*) vegetable and cellulose rayon fibres and (*b*) animal fibres, particularly wool fibres, are described and discussed on the basis of American patent specifications. **C—4K.**

Spun Rayon Fabrics: Finishing. Adeline A. Dembeck. *Rayon & Synth. Textiles*, 1950, **31**, No. 5, 108. Two special finishes for the improvement of spun rayon fabrics are reported. The "Unidure" finish gives a high degree of crease resistance and also improves handle, body, and resistance to perspiration and soiling. In addition to these properties the "Unisec" finish gives also a durable water repellency. Both finishes are not affected by dry cleaning of washing. **C—4K.**

Synthetic Resins: Laboratory Application to Textiles. U. V. Solanki. *Indian Textile J.*, 1950, **60**, 496-498. A simple laboratory method for the application of synthetic resins to textiles is briefly described. The fabric is soaked in a solution of the resin and carefully dried. The evaluation of the properties of the resin-impregnated fabric is also indicated. These properties include stiffness, wrinkle recovery, and tensile strength. **C—4K.**

"Solvitose" Modified Starches: Textile Application. ("Improved Colloids for Textile Processing.") F. A. Möller. *Brit. Rayon and Silk J.*, 1950, **26**, May, 60-61. The unsatisfactory properties of natural starches for textile purposes (for printing, sizing and as a thickening agent, *etc.*) are discussed. Modified starches such as dextrinised starches, starches combined with a lubricant and etherified starches are briefly considered. The "Solvitose" etherified starches are particularly useful because they do not crystallise on standing. Micrographs are reproduced to show the effect of freezing and thawing on solutions of natural starches and Solvitose. **C—4K.**

Synthetic Waxes: Textile Applications. J. H. Dollinger. *Rayon & Synth. Textiles*, 1950, **31**, No. 5, 106-107. Some uses of synthetic waxes in textile processes include the production of waterproof fabrics, to give lustre and flexibility for special finishes, as delustrants, as thickeners, and as media for the suspension of pigments, and as "table waxes" to hold the fabric to the table in screen printing. The properties of some synthetic waxes are briefly indicated. **C—4K.**

Nylon Fabrics: Setting. G. K. Mecklenburgh. *J. Textile Institute*, 1950, **41**, 161-175. Results are given of tests on the relation of setting and shrinkage of nylon fabrics. The mechanism of setting is discussed and wet steam and dry heat (including American processes) methods are described. The more severe conditions are able to set nylon fabrics to resist creasing, distortion, and fabric

shrinkage, providing that the setting conditions used are not exceeded during the subsequent life of the material. Practical trials on a modified pin stenter are reported. C—**4K.**

Watering and Embossing: Common Faults and Practical Remedies. *Wool Record*, 1950, **77**, 1670, 1673, 1674. Some of the worst causes of watering, embossing and imprinting are in the setting operation, blowing (decatising), and the cloth pressing operation. Methods for eradicating and correcting these faults include treatment in the stocks, steaming on the steaming and brushing machine, light dollying, *etc.* W—**4K.**

(L)—PROOFING

Impregnated Fabrics: Water-resistant and Weather-proof Properties. S. F. Burdin, M. N. Zusman and O. A. Samsonova. *Tekstil. prom.*, 1947, No. 9, 28-29 (through *Brit. Abstr.*, 1950, B II, 244). Extensive trials on the effects of a wide range of impregnating agents are reported. Salts of copper and iron are as effective as is aluminium acetate in imparting water-resistance in the presence of paraffin wax emulsion. Ozokerite is an effective substitute for paraffin wax. Dyed fabrics are more water-repellent than when undyed. Increased rot-resistance is produced by salts of copper but not of aluminium or iron; copper and iron salts increase light fastness of sulphur khaki dyes. Best results are obtained by a paraffin wax emulsion fixed by copper sulphate and potassium bichromate. Paraffin wax-casein emulsion lowers the loss of fabric strength, but does not impart sufficient water resistance. C—**4L.**

Zirconium Compounds: Application as Water Repellents for Fabrics. W. B. Blumenthal. *Ind. Eng. Chem.*, 1950, **42**, 640-642. The development of water-repellent treatments for fabrics, based on the use of Zr salts, is reviewed briefly. Experimental work is reported in which it is shown that Zr salts used alone render textiles somewhat water repellent, and when used in conjunction with soaps and wax emulsion, a very high degree of water-repellency results. Such water-repellency is generally lost by laundering or dry cleaning, but may be stabilised to some extent by treatment with an additional solution of a metal salt having a strongly acid hydrolysis. A mechanism for the repellency of water by the treated fabric is propounded. C—**4L.**

Textile Fabrics for Mining: Protection. A. E. Williams. *Mining Mag.*, 1950, **82**, 20-23 (through *Chem. Abstr.*, 1950, **44**, 3261[a]). Non-poisonous preservatives suitable for application to textiles used underground have been studied. Brattice cloth for ventilation and flannel for air filtration have a very short life owing to attack by micro-organisms unless so treated. Cu and Zn naphthenates appear to be the most successful agents. The naphthenic acids used in their preparation are complex acids of petroleum origin, considered to be homologues of cyclopentane structure. Results are tabulated of tests made on canvas treated with 4·2 per cent. and 8·4 per cent. Zn and Cu emulsions. Its tensile strength was compared after a period of use with that of untreated material. Strengths varied between 123 and 154 lb. for all the test pieces, compared with 1 lb. for untreated material. Zinc naphthenate is particularly good in conditions of especially high humidity. C—**4L.**

(M)—INSPECTION AND PACKAGING

Rayon Fabrics: Inspection and Quality Control. ("Qualitätskontrolle im Fertigungsprozess.") Fritz Weiss. *Kunstseide u. Zellwolle*, 1949, **27**, 408-410. Methods for detecting faults on finished rayon fabrics and measures for preventing faults during manufacture are discussed and illustrated. C—**4M.**

PATENTS

Silk Fabrics: Continuous Wet Treatment in Open Width. Vereinigte Färbereien & Appretur A.-G. B.P.630,160 of 24/2/1947; 6/10/1949 (Conv., 30/10/1946). The invention relates particularly to a method and apparatus for the guiding of silk fabric in open width during a continuous acid treatment and washing. The fabric is guided by a "jet comb" consisting of pairs of opposed fluid jets that intersect on a common transverse line in the fabric. The jets are regulated so that they exert a guiding action, but are not powerful enough to carry the fabric forward. The fabric is drawn through the bath with sliding movement by means of convex guide elements. C.

Parchmentised Prints on Cellulose. Bleachers' Association Ltd., Franklin Farrington, A. E. Stubbs and Eric Hall. B.P.630,172 of 7/6/1947: 6/10/1949. Cotton or other cellulosic fabrics are printed with pastes (which may contain suitable dyes) that include quaternary-ammonium salts of the type of Velan PF or other nitrogenous agents (*e.g.* isocyanates), that render cellulose water-repellent, and then passed through sulphuric acid and mercerising baths to parchmentise the unprotected ground. Matt (and coloured) prints are obtained on a transparent background. C.

Glass Fibre/Synthetic Resin Combinations: Production. A. P. Thurston (for Owens-Corning Fiberglas Corporation). B.P.630,199 of 24/5/1946: 7/10/1949. The invention relates to the addition to thermo-setting resins (allyl and styrene co-polymers) of 0·1 to 1 per cent. of an organo-silicon compound of the type $(CH_2{:}CR{\cdot}CH_2O)_3Si$ (R = H, alkyl, aryl or halogen) in order to effect better union with glass fibres in forming laminates or coating spun glass fabric with plastics. C.

Anthraquinone Vat Dyes: Preparation. Ciba Ltd. B.P.630,375 of 11/2/1947: 12/10/1949 (Conv. 12/2/1946 and 15/1/1947). The claim is for a series of vat dyes obtained by heating an anthraquinone-2-carboxylic acid (or preferably the acid chloride), which contains in position 1 an amino-group (or reducible NO_2 group or replaceable Cl) and in position 4 a cyano group, with an amine that contains at least one exchangeable H atom, especially an amine of the anthracene series. The examples refer to scarlet to violet dyeings on cotton. C.

Polyazo Pyrazolone Dyes free from Sulphonic Acid Groups. Ciba Ltd. E.P. 630,452 of 8/4/1947: 13/10/1949 (Conv. 16/4/1946 and 14/2/1947). The claim is for a series of polyazo dyes made by coupling two molecular proportions of the same or different diazotised amines, at least one of which is of the type $NH_2{\cdot}R_2\langle^{X}_{Y}$, with a coupling component of the type $Py_1{\cdot}R_1{\cdot}Py_2$. [$R_2$ is a benzene radical, X is a group adjacent to the NH_2 group that can enter into complex formation with metals (*e.g.* OH), Y is an acid amide group, and R_1 is a diphenyl group bound in the 4 and 4′ positions to the 1-position of pyrazolone systems, *e.g.* 3-methyl-5-pyrazolone.] The examples refer to fast yellow and reddish yellow dyeings after coppering on cellulose. C.

Proteinaceous Materials: Improvements in Bleaching. Solvay & Cie. B.P. 636,479 of 3/5/1950. Wool and other proteinaceous material of animal origin may be bleached by treating at ordinary temperatures not below 10° C. with an aqueous solution of alkali metal or alkaline earth chlorite brought to *pH* 4-5 by previous acidification with or without the addition of a wetting agent. If the *pH* of the solution is adjusted to a *pH* near the isoelectric point of the protein under treatment, the resultant chlorine dioxide does not react to any great extent with the keratin. Examples of material bleached by his method include wool, rabbit's skin, silk, and depilated calf skin. W.

Dyeing Wool. Ciba Ltd. B.P.637,665 of 24/5/1950. Wool is uniformly impregnated in a non-acidic dye solution. It is then squeezed and brought into sudden contact under atmospheric pressure with a strongly-heated, preferably boiling, acidic solution for ½–10 min. The process may be continuous, and may include after-treatment, *e.g.* for chrome dyes and for ester salts of leuco-compounds of vat dyes. Examples relate to the treatment of piece goods, slubbing and loose wool. W.

Animal Fibres: Anti-shrink Treatment. Stevensons (Dyers) Ltd., J. L. Raynes and F. M. Stevenson. B.P.638,580 of 14/6/1950. Modification of B.P. 569,730 (*J. Textile Institute*, 1945, **36**, A418). Goods consisting wholly or partly of wool are treated with a dilute solution of a permanganate compound at a temperature not exceeding 60° C. and at *pH* 5–10, before or after bleaching with a solution of a sulphur-containing reducing agent at *pH* 5–10·5. The addition of hypochlorite to the permanganate solution, as described in B.P.569,730, is not necessary. W.

Wool and Other Animal Fibres: Improving Properties. N. V. Onderzoekings-instituut Research. B.P.630,155 of 21/6/1950. Wool goods are immersed at 40–45° C. and at *pH* 2·8–5·0 in a dilute aqueous acid precondensation solution containing 1 gram-molecule of resorcin or a substituted resorcin, and at least 6 gram-molecules of formaldehyde. The goods are then centrifuged, and dried

and hardened by heating to about 100° C., preferably 105° C. The treated material is soft; shrinkage and mechanical fluffing-off are decreased, and also tendering due to the action of alkali, acid and bleaching agents. W.

Wool: Treatment with Amines. G. C. Le Compte. U.S.P.2,493,705 of 10/1/1950. Modified wool, which has increased strength and which is resistant to shrinkage and to damage by natural organisms, is produced by treatment with amines. In examples, the amines used are morpholine, diethanolamine and triethanolamine, *etc.* Wool impregnated with 30 per cent. aqueous triethanolamine, and then dried at about 150° C. for 30 min., showed no shrinkage in a standard test. W.

Protein-containing Materials: Shrinkproofing. E. L. Kropa and A. S. Nyquist (to American Cyanamid Co.). U.S.P.2,499,653 of 7/3/1950. Wool and wool-containing materials are treated with a maleic anhydride-acrylate copolymer composition, and then cured. The material has excellent resistance to shrinkage which is permanent to laundering, increased tensile strength, and a soft handle. W.

5—ANALYSIS, TESTING, GRADING AND DEFECTS

(A)—Fibres

Artificial Cellulose Fibres: X-Ray Investigation of Stretching Process and Fine Structure. W. Kast and A. Prietzschk. *Kolloid-Z.*, 1949, **114**, 23-35 (through *Chem. Abstr.*, 1950, **44**, 3250[i]). The normals to the large (1 0 1) faces of crystallites in fibres of regenerated cellulose do not specify the orientation completely. An X-ray focussing method is described for the determination of the angular distribution of (0 2 0) normals. For equal tensile strength (S), the percentage elongation (E) increases with the ratio of the half-width α of the (1 0 1) distribution to β, that of (0 2 0). As the amount of stretching during manufacture is varied, the change in SE parallels that in α/β^2. Both of these indexes suggest that stretching of cuprammonium fibres in the spinnerette is beneficial but stretching after coagulation is harmful. The ratio of the maximum intensities of X-ray reflections $(1\,0\,\bar{1})/(0\,0\,2)$ is a measure of distortion of the structure and of the tendency of the fibre to shrink. C—**5A.**

Cellulose Fibres: Orientation and Strength. ("Orientierung und Festigkeit von Zellulosefasern.") W. Kast, L. Flaschner and E. Winkler. *Kolloid-Z.*, 1948, **111**, 1-6. The average degree of orientation has been determined for two series of cuprammonium fibres (Bemberg) and two series of viscose fibres from the azimuth half-width. When the orientation of the viscose rayon is plotted against per cent. stretching and that of the cuprammonium rayon against "tension in the optimum coagulation condition", the curves show the same course and reach the same limit values in both cases. Great differences are observed when the orientation of the Bemberg and viscose fibres is plotted against their specific dry strengths; at the same mean orientation the specific dry strength of the Bemberg fibres is about 80 g./den. lower than that of the viscose fibres. This indicates that an essential requirement for the achievement of high strength (probably a sufficient density of the micellar network) is not fulfilled in cuprammonium fibres. C—**5A.**

Cellulose Fibres: Ratio of Crystalline and Amorphous Substance. ("Eine röntgenographische Methode zur Bestimmung des Verhältnisses von kristalliner und amorpher Substanz in Zellulosefasern.") W. Kast and L. Flaschner. *Kolloid-Z.*, 1948, **111**, 6-15. A new method for determining the ratio of crystalline and amorphous substance in a cellulosic fibre from its X-ray diagram is based on the relation of background intensity level to the product of azimuthal and radial intensity distributions in the A_6 maximum. Experimental results for a cuprammonium fibre show the crystalline content to be 35 ± 12 per cent. C—**5A.**

Cotton Fibres: Effect of Dyeing on Technological Properties. V. V. Taleporovskaya. *Tekstil. prom.*, 1948, No. 5, 17-19 (through *Brit. Abstr.*, 1950, B II, 240). Undyed cotton fibres are compared with cotton dyed loose with sulphur dyes (khaki and black). The staple length is unaffected by dyeing, the tenacity is little affected, the coefficient of friction increases by 5-6 per cent., and the hardness or resistance to deformation of a wad of fibres increases by 15 per cent. These changes affect the spinning properties of the cotton. C—**5A.**

Fibres and Films: Determination of Young's Modulus. R. Pinoir and A. Dubois. *Abrgd. Sci. Publ. Kodak Res. Labs.*, 1948, **30**, 259-263 (Publ. 1949). (From *J. phys. et radium*, 1948, **9**, 20-24.) A dynamic method for the determination of Young's modulus of plastic materials (fibres and films) is briefly described. A fibre or ribbon is supported at one end by a metal bar and at its other end carries a known weight. A series of longitudinal elastic deformations is produced along the material by striking the bar. A pick-up in contact with the material at a known distance from the origin transmits the vibration, as a variable e.m.f., *via* an amplifier to a cathode ray oscillograph. From measurements on the sweep of the light spot of the oscillograph, the speed of propagation of waves in the material, and hence Young's modulus, may be obtained. Some results are given for various materials, including cotton and nylon fibres. C—**5A.**

Polyvinyl Chloride Fibre: Cold-drawing. F. H. Müller. *Kolloid-Z.*, 1949, **114**, 59-61 (through *Chem. Abstr.*, 1950, **44**, 2333[h]). Polyvinyl chloride fibres drawn at various temperatures (23-92° C.) show a critical region in a plot of percentage extension against applied tension, similar to that in the *P–V* diagram of a gas. It involves two co-existing phases (liquid and crystal), which can be mathematically treated by analogy with the van der Waals equation. The analogue of van der Waals's *a* is treated as constant. C—**5A.**

Textile Fibres: Identification for Dyeing. E. A. W. Boyce. *Amer. Dyes. Rept.*, 1950, **39**, 292. A brief account is given of methods of identifying textile fibres for dyeing under the headings: visual tests, burning tests, microscopy, chemical tests, and stains. C—**5A.**

Viscose Rayon Fibres: X-Ray Measurements. *Monatshefte für Chemie*, 1949, **80**, 735-737 (through *Chem. Abstr.*, 1950, **44**, 2752[f]). X-Ray measurements on viscose rayon obtained in this investigation are compared with the values determined by others. All data are substantially the same. C—**5A.**

High-speed Spinning Test Unit. ("Design for Quick Production of Spinning Tests.") Frank Dunkerley. *J. Textile Institute*, 1950, **41**, 148-160. The high-speed spinning test unit at Giza is described under the headings: the building, the machines, the passage of a sample through the unit, control of sections within the unit, the staff required, production rates and running times, and elimination of errors. The unit would produce 15,800 sample test-results in a working year of 280 days. C—**5A.**

Nickerson-Hunter Cotton Colorimeter. ("Instrument Measures Color of Cotton.") Henry A. Gardner Laboratory Inc. *Textile World*, 1950, **100**, No. 5, 111. Brief information (with illustration) is given of the Nickerson-Hunter cotton colorimeter. This electronic instrument automatically determines the colour of cotton and thus aids grading, and in certain cases gives the grade directly. C—**5A.**

Phase Contrast Microscope: Textile Applications. ("Ein Fortschritt der Textil-Mikroskopie.") H. Reumuth. *Kunstseide u. Zellwolle*, 1950, **28**, 1-10, 37-44. The history, optical principles, apparatus, efficiency, and applicability of phase contrast microscopy are described. Numerous phase contrast micrographs of different fibres are reproduced, illustrating the application of this technique in laundry research and in the investigation of sizing and printing processes. There are 30 references to the literature. C—**5A.**

Radio-active Beta Thickness Gauge. ("A New Electronic Instrument.") F. C. Robinson and Partners Ltd. *Textile Mercury & Argus*, 1950, **122**, 1045; *Textile Weekly*, 1950, **45**, 1648. An illustration is given of an instrument for measuring the weight per unit area of spongy materials (*e.g.* fibre laps) in which the material passes between a chamber containing radio-active isotopes and an ionisation chamber where the electrons that pass through the material are made to give an indication of thickness on a calibrated dial. C—**5A.**

Servo-controlled Tensile Strength Tester. G. S. Burr. *Electronics*, 1949, **22**, 101-105 (through *Elec. Engng. Abstr.*, 1945, **52**, 333). A servo-controlled tensile strength tester is described that permits several types of tests including cycling tests on plastics, textiles and rubber. Several records of cycling and other tests are shown. C—**5A.**

Cotton: Maturity; Importance and Control. ("La maturation du coton. Son contrôle, son importance.") O. Roehrich. *Bull. Institut Textile, France*,

1950, No. 17, 9-32. An illustrated review is given of the growth of the cotton hair, the structure of mature and immature fibres, and the evolution of *Gossypium*. Published methods for measuring maturity are described and discussed. It is pointed out that the double coloration method due to Goldthwait *et al*[1] is only accurate for cottons of the same diameter. The influence of cotton immaturity on spinning is considered on the basis of papers by Lord and by Webb. Finally, the possibility of breeding high-maturity cotton strains is examined. ([1]*J. Textile Institute*, 1947, **38**, A513.) C—**5A.**

Cotton Bales: Routine Moisture Tests; Error Survey. W. L. Balls. *J. Textile Instit.*, 1950, **41**, T127-T134. A statistical technique based on the use of Tippett's factor has been applied to a survey of the errors involved in assessing the moisture content of samples of cotton from the bale. Four classes of error are considered: (i) in the oven tests; (ii) as between two sets of samples from the same bale; (iii) between one bale and another in the same lot; and (iv) in the presshead technique. The use of the less accurate, though more speedy, air test method[1] in place of the oven test is considered. Conclusions are illustrated by means of right-angled triangles whose sides are proportional in length to the square roots of the standard deviations. ([1]*J. Textile Institute*, 1950, **41**, A131.) C—**5A.**

Cotton Fibres: Testing in the Mill. "There are Practical Limits to Cotton Testing in the Mill.") E. H. Helliwell. *Textile World*, 1950, **100**, No. 5, 101, 314, 316. The value and practical limits of cotton testing in the mill are discussed in the light of a recent suggestion that an experienced, skilful cotton classer is of more value to the mill than fibre length, fibre maturity, *etc.*, testing devices. C—**5A.**

Grade Standard Cotton Bales: Foreign Matter Content. Dorothy Nickerson. *Textile Research J.*, 1950, **20**, 277-278. The foreign-matter content of the bales of cotton used in preparing standards for the 1936 and 1946 International Cotton Grade Standards Conferences has been determined by means of the Shirley Analyzer. Results show good agreement in percentage of trash content between the 1936 and 1946 standards bales for the same grades. C—**5A.**

Cellulose Fibres: Specific Surface; Determination by the Liquid Permeability Method. A. A. Robertson and S. G. Mason. *Pulp Paper Mag. Canada*, 1949, **50**, No. 13, 103-110 (through *Chem. Abstr.*, 1950, **44**, 4250[a]). The authors discuss the theoretical basis of the Kozeny-Carmen equation. In the experimental work the equations used were: $Q = KAp/\eta L$ and $(Kc^2)^{\frac{1}{2}} = (1/5{\cdot}55\ \sigma^2)^{\frac{1}{2}}\ (1 - ac)$ where Q = volume rate of flow through the bed; p = pressure drop across the bed; A = the bed cross-sectional area; L = bed depth; η = viscosity of fluid; K = permeability coefficient of the bed; c = concentration of pulp in the bed, in gms./cc.; a = effective specific volume, cc./gm.; and σ = specific surface, sq. cms/gm. K is determined at several values of c. A plot of $(Kc^2)^{\frac{1}{2}}$ against c yields a straight line if the equations hold. σ and a are determined from the $c = 0$ intercept and slope of the line. A relatively simple apparatus was constructed to permit the evaluation of a and σ. σ for several sulphite and kraft pulps was determined, and was found to increase almost linearly with beating time; a increased to a maximum, then levelled off. Both σ and a correlated fairly well with sheet strength. C—**5A.**

Cellulose: Microbiological Degradation. G. A. Greathouse. *Textile Research J.*, 1950, **20**, 227-238. Microbiological agents (fungi and bacteria) that degrade cellulose are briefly considered. The mechanism of the degradation of cellulose is discussed under the headings 1-3. (1) The effect of fungal and bacterial attack on cotton fibres as revealed by alkali solubility, copper number, fluidity and loss in tensile strength. (2) The relationship between molecular structure and micro-biological resistance as determined with derivatives. Such derivatives as cellulose acetate and triacetate, ethylcellulose, methylcellulose, 6-cyanoethylcellulose, cellobiose octacetate and penta-acetyl glucose have been investigated; (3) Cellulose enzymes are discussed, including optimum conditions for activity (temperature and *pH*), and the preparation of extracts containing active cellulases from fungi. An appendix deals with the techniques involved in the work described, including the determination of alkali solubility, copper number and fluidity. A bibliography of 65 references is given. C—**5A.**

Cellulose: Mercerisation by Caustic Soda. ("Sur la mercerisation de la cellulose par la soude.") Édouard Calvet. *Mém. Services Chim. État*, 1948,

34, 163-177. Experimental details and results are reported of an investigation comprising: (i) a micro-calorimetric study of the fixation of soda by cellulose (natural and mercerised cotton linters, viscoses) immersed in caustic soda solutions; (ii) the determination of the heat of mercerisation; (iii) a calorimetric study of the reversibility of the phenomenon of mercerisation; and (iv) an interferometric study of mercerisation. The latter confirms the conclusions drawn from the calorimetric studies and demonstrates the irreversibility of mercerisation as well as the existence of a complex mercerised cotton-caustic soda completely dissociated at about 40° C. or in contact with very dilute caustic soda solutions. C—**5A.**

Cellulose: Reaction with Alkalis. ("Sur la réaction de la cellulose avec les alcalis.") Geneviève Petitpas. *Mém. Services Chim. État*, 1948, **34**, 125-137. The swelling of cellulose in caustic alkalis has been studied by the Vieweg and centrifugation methods. The results are compared with those obtained by other investigators and an attempt is made to interpret them by pointing out the role played by water and by referring to the structure of the alkali-celluloses obtained and to certain properties of the alkali solutions used (NaOH, KOH, and LiOH). C—**5A.**

Cellulose: Variation of Structure in Caustic Alkalis. ("Variations de structure de la cellulose daus les lessives alcalines.") Thérèse Petitpas. *Mém. Services Chim. État*, 1948, **34**, 139-147. The structural variations of cellulose subjected to the action of Na, K and Li hydroxide solutions have been studied by means of X-ray diagrams, the retention and absorption curves of the solutions being used as basis. C—**5A.**

Native Cellulose: Absorption of Caustic Soda. ("Absorption de la soude caustique des lessives par la cellulose native. Formation de l'alcali-cellulose.") André Bréguet, Robert Viatte and Henri Perra. *Mém Services Chim. Etat*, 1948. **34**, 149-151. The swelling of cotton linters in caustic soda solutions of increasing concentration has been followed by the centrifugation method. The results indicate three zones of alkaline swelling: a first, ranging from 0 to 11·5 volume per cent. of NaOH, in which only the amorphous parts of the fibres are attacked; a second ranging from 11·5 to 20·5 volume per cent. NaOH, in which the crystalline parts of the fibre are progressively transformed (formation of hydrate cellulose); and a third zone between 20·5 and 35 volume per cent. NaOH, where the NaOH absorption increases linearly as new hydroxyl groups of the cellulose molecule become accessible, whereas the swelling by water decreases regularly. The results are in good agreement with those obtained by X-ray analysis. (See also *J. Textile Institute*, 1950, **41**, A214.) C—**5A.**

Pigment Precipitates: Deposition in Cellulosic Fibres. ("Über die Bildung von Niederschlägen auf Gespinstfasern.") R. Haller. *Textil-Rundschau*, 1950, **5**, 94-98. Experiments were carried out to elucidate the phenomenon of the preferential formation of precipitates from molecularly dispersed solutions on the outer surface of cellulosic fibres. Model experiments indicate that the precipitate is formed within a diffusing layer in the fibre membrane very close to the surface. The use of fibres swollen in different ways does not affect this preferential pigment deposition. C—**5A.**

Regenerated Cellulose: Absorption and Fixation of Caustic Soda. ("Absorption et fixation de la soude caustique des lessives par la cellulose régénérée de viscose.") André Bréguet, Robert Viatte and Henri Perra. *Mém. Services Chim. Etat*, 1948, **34**, 153-155. The swelling of regenerated cellulose in caustic soda solutions of increasing concentration has been followed by the centrifugation method. A high-tenacity viscose rayon yarn was produced for the study from the cotton linters used in the parallel study on native cellulose. The curve of swelling in water shows a sharp maximum at 10·25 volume per cent. NaOH The curve of caustic soda absorbed presents two maxima, the first corresponding to the swelling maximum and a second, at 27·15 volume per cent. NaOH. Three zones may again be distinguished, the first representing, due to the great accessibility of the amorphous part of the fibre, a rapid formation of ionised sodium salt. The osmotic pressure inside the gel increases more rapidly than that of the surrounding caustic alkali, swelling increases very rapidly, the crystalline regions are deformed, and the fibre passes partially into solution. In the second and third zones the formation of ionised sodium salt is complete, the osmotic pressure of the caustic solution is higher than that of the gel which

deswells regularly. The second maximum of the absorption curve thus seems to coincide with a change in fibre structure. Regenerated cellulose combines with sodium at lower NaOH concentrations than does native cellulose. C—**5A.**

Alginate Fibres: Structure. E. E. Tallis. *J. Textile Institute*, 1950, **41**, T151-T157. An account is given of the structure of alginate fibres and the orientation of the pyranose rings is discussed. The use of X-ray examination to determine the degree of crystallinity of the fibres is mentioned and X-ray photographs of alginic acid and alginates are presented. C—**5A.**

Jute: Moisture Regain Determination. W. G. Macmillan and R. R. Mukherjee. *Fibres*, 1950, **11**, 173-181. Laboratory methods for the determination of moisture in jute are reviewed under (*a*) Drying methods—oven and desiccator; (*b*) Humidity methods; (*c*) Chemical and distillation methods; (*d*) Electrical methods —depending on changes in resistance or dielectric properties of fibres. Experimental procedures are discussed and the methods are compared. Heating by means of infra-red radiation in place of the usual oven is considered. C—**5A.**

Nylon: Determination in Fibre Blends. ("Neue Methoden zur Bestimmung von Nylon in Fasergemischen.") J. Lanczer. *Textil-Rundschau*, 1950, **5**, 92-94. A study of the dyeing of nylon with Naphthol dyes has provided an explanation of the difference in shade of dyed nylon and cellulosic fibres. New methods for identifying nylon in undyed and dyed fibre blends depend on the functioning of nylon as diazo component, and on the fluorescence exhibited by nylon after boiling in Naphthol-AS solution followed by acidification with acetic acid. C—**5A.**

Nylon and Wool Fibres: Frictional Properties. G. King. *J. Textile Institute*, 1950, **41**, T135-T144. The frictional coefficients of nylon and wool fibres have been determined by a slip/stick technique for contact with various surfaces such as horn, nylon and ebonite. The effect of surface roughness on the directional frictional effect of the wool fibre, and the action of swelling agents on the frictional coefficients of wool and nylon fibres have also been examined. A close relationship between the elasticity of the rubbing materials and their coefficient of friction is suggested by the results. The relationships between frictional coefficient and normal pressure is discussed. C—**5A.**

Wool Fibre Diameter Uniformity. P. Larose. *J. Textile Institute*, 1950, **41**, T173-T177. Measurements of fibre diameter by the projection microscope were made on a large number of samples from fleeces of experimental flocks. Graphs are given showing the relation between wool quality, mean diameter and standard deviation. W—**5A.**

Crimp: Effect on Fibre Behaviour. Part I: The Determination of Fibre Irregularities and the Concepts of the Single-Fibre Bulking Capacity. L. W. Rainard and D. Abbott. *Text. Res. J.*, 1950, **20**, 301-307. It is recognised that there are many aspects of crimp which cannot be defined in terms of frequency and amplitude measurements, and the method which is described consists essentially of placing a fibre in a long slot, the width of which is roughly the width of a standard roving. The fibre is then flattened into a plane; a system of parallel lines, of spacing smaller than the smallest crimp, is superimposed on it, and on a projected image the number of times the fibre intercepts the grid is determined. A method for determining roving diameters is also described, and an empirical expression, which to a fair degree allows the prediction of equilibrium roving diameters from measurements of properties of single fibres has been obtained. Graphs showing condensation rates for various fibres using (*a*) short, and (*b*) long, rub-apron strokes are reproduced. The fibres used are nylon 15 denier, and Joria, New Zealand crutchings, South American, Australian 58s and Australian 70s wools. W—**5A.**

Crimp: Effect on Fibre Behaviour. Part II: Addition of Crimp to Wool Fibres and Its Effect on Fibre Properties. J. L. Barach and L. W. Rainard. *Text. Res. J.*, 1950, **20**, 308-316. The crimping apparatus described is a modification of the stuffer box crimper, and is capable of handling more than 300 lb. per hour. It consists essentially of a setting chamber in which the fibres are densely packed, and setting is achieved by means of high-temperature steam or solutions of reducing agents. Contact periods of from 30 seconds to 3 minutes are sufficient to impart a permanent angular crimp. Photographs of crimped and uncrimped fibres rubbed into rovings are included, and changes in diameter of

the rubbed bundles are noticeable. Differences in the covering power of crimped and uncrimped wools are also marked. Euler's formula for critical load is discussed. Laboratory experiments have shown that there is an actual increase in resistance to wear for carpets made with crimped fibres over those made with straight fibres, which implies that the real difference between tough, long-wearing and good-covering wools as opposed to those which are easily crushed and which show poor resistance to abrasion is one of degree of crimp. The authors contend that the major effect of crimp on wool is a change in geometry rather than fibre degradation, and that fibre strength is lowered because the shape produces a stress concentration in the fibre of a different order of magnitude from that of naturally crimped fibres. W—**5A.**

Wool: Analysis of Modifications produced by Chemical Treatments. ("Zur Analyse von Veränderungen an Wolle durch chemische Vorbehandlung.") H. Zahn. *Textil-Praxis*, 1950, **5**, 315-9. Samples of loose wool were given ten different chemical treatments and were tested for alkali solubility, dyeing behaviour, and supercontraction in phenol and in sodium sulphite solution. The sensitiveness and range of application of the various tests are discussed. W—**5A.**

Wool: Strength Testing. ("Nouvelle méthode d'étude de la résistance à la rupture des fibres de laine.") P. Maillard, O. Roehrich and M. J. Hitter. *Bull. Institut Textile France*, 1950, No. 19, 9-10. A method for calculating the breaking length and the breaking elongation of wool by tests in bulk and not fibre by fibre is described. For this purpose a combed bundle of fibres is prepared. The procedure for determining the breaking elongation used for these tests is described. The method can be applied to wool in several stages of manufacture. The authors consider that significant figures can be obtained from about twenty tests. W—**5A.**

Wool Staple: Measurement of Length of Fibres. H. Goot. *J. Textile Institute*, 1950, **41**, T197-T198. A method of measuring the fibre length distribution in a wool staple is suggested, in which the lock is cut into one-centimetre sections and the fibre pieces in each section are counted. W—**5A.**

Wool and Other Textile Materials in Bales: Determination of Yield and Shrinkage. ("Note sur une nouvelle méthode d'appréciation des matières textiles brutes, fournies en balles pressées et destinées à être cardées.") L. Goossens. *Rayonne*, 1950, **6**, No. 6, 98-100. The core testing method for the determination of wool yield and shrinkage (*J. Textile Institute*, 1950, **41**, A134) is discussed, including the sampling technique and the calculation of the number of bales to be sampled. The application of the method to the testing of jute bales is suggested. W—**5A.**

(B)—YARNS

Cotton, Wool and Rayon Yarns: Thread Diameter Variation. A. Barella. *Rev. Cienc. apl.*, 1949, **3**, 277-285 (through *Brit. Abstr.*, 1950, B II, 230). The diameter (D) of a thread varies with the count (N) and the twist (t) according to a semi-empirical equation, $D=[(1+et^2)^{0.5}/N(a+bt)\pi]^{0.5}$, where a, b, and e are material constants. The significance of these constants is discussed and the term $(a+bt)$ is equal to the apparent density of the thread. The equation is verified experimentally for a series of different materials, including cotton, wool and rayon. The apparent density of the thread cannot exceed the density of the fibres composing it, and when all the air has been expelled by torsion, further torsion breaks the thread. The critical diameter (D_c) corresponding to this density can be calculated, and is related to the diameter (D_0) (untensioned thread) and the breaking load (F) by the equation, $D_c=D_0-KF^{0.5}$, where K is a characteristic of a given material and is listed for the most important fibres. C—**5B.**

Viscose Rayon: Contraction on Wetting. A. A. Rogovina. *Tekstil. prom.*, 1948, No. 1, 29-31 (through *Brit. Abstr.*, 1950, B II, 232). A study of the contraction on wetting of 150-denier delustred viscose yarn stretched in the dry and wet states is reported. With dry-stretched yarn, the deformation is 80-90 per cent. reversible, but the residual elongation of wet-stretched and subsequently dried yarn is almost entirely irreversible. Increased tension in drying of wet-stretched yarn produces increased residual elongation and a corresponding increased contraction on re-wetting. The chief cause of shrinkage of viscose rayon fabric in laundering is the reversible deformation of the yarn. C—**5B.**

Artificial Fibre Yarns: Measurement of Elasticity. S. Silverman and J. W. Ballou. *Electronics*, 1945, **18**, 103-105 (through *Elec. Engng. Abstr.*, 1946, **49**, 28). Young's modulus is determined in artificial fibre threads by measuring the velocity of sound in them and applying the equation $V = \sqrt{(E/d)}$ where E is Young's modulus and d the density. The thread is vibrated by a piezo-electric crystal excited from an audio-oscillator and standing waves are detected by another crystal pickup. Subject to certain precautions the method is simple and rapid. C—**5B.**

Carpet Mill Raw Material Supplies: Inspection. ("Incoming-material Inspection Pays off at Alexander Smith.") Jesse de la Rama. *Textile World*, 1950, **100**, No. 5, 71, 330-333, 339-340. An account is given of the system used by an American carpet mill to check and establish standards for incoming raw materials. The system ensures that raw materials are of a uniform high quality and by eliminating poor supplies enables expenditure to be cut. C—**5B.**

Crêpe Yarns: Speed of Contraction on Desizing. ("Mesure de la vitesse de contraction des fils crêpes au désencollage.") Jean Henno and Robert Jouhet. *Bull. Institut Textile, France*, 1950, No. 17, 55-56. A brief illustrated description is given of an apparatus for the measurement and recording of the rate of contraction and total contraction of crêpe yarns during desizing. The arm of the recording device is carried by a small carriage which slides to a position governed by the tilt of a balance arm to which one end of the crêpe yarn is attached. C—**5B.**

Nylon Yarns: Chemical Resistance. E. I. du Pont de Nemours & Co., Inc., Nylon Division. *Rayon & Synth. Textiles*, 1950, **31**, 91. The effects of various chemical treatments on nylon have been studied. Compounds having no or little effect on the tenacity and elongation of nylon yarn, treatments causing no significant loss of strength in samples of nylon yarn, bristles and fish-lines, treatments causing dissolution or other permanent deteriorations of nylon yarn, and swelling agents for nylon yarn are listed. C—**5B.**

Rayon Yarn Load/Elongation Determination Apparatus. ("Dispositif d'essais pour la mesure des propriétés mécaniques des rayonnes en atmosphère à humidité très basse.") Jean Henno and Robert Jouhet. *Bull Institut Textile, France*, 1950, No. 17, 59-62. A brief description is given of an apparatus for the determination of load/elongation relations for viscose and acetate rayon, and natural silk yarns. The apparatus is contained in a watertight enclosure in which relative humidities down to zero can be established. C—**5B.**

Yarns: Critical Diameter and Twist. Alberto Barella. *Textile Research J.*, 1950, **20**, 249-258. The effect of increased twist on yarn density is explored and a law of critical diameter is postulated. It is suggested that at the time the yarn breaks under tensile load the density of the yarn is equal to the fibre density. The influence of twist on contraction is examined and prediction formulæ are given for cotton, woollen, worsted, and rayon yarns. C—**5B.**

Yarns: Regularity Testing. ("Garnprüfung und Spinnvorgang.") Rudolph Thun. *Textilberichte*, 1949, **30**, 446. A test method is described which will permit the determination of periodically occurring yarn defects and gives an indication of the causes of these defects in the spinning process. Experimental results of breaking tests and yarn thickness measurements are used for this purpose. A working hypothesis for the procedure of counting marked differences between consecutive values and the necessary corrections is developed. C—**5B.**

Rope Elongation. Part II. D. Himmelfarb. *Fibres, Fabrics & Cordage*, 1950, **17**, No. 3, 86-88. Rate of loading does not appear to affect elongation. In service, elongation characteristics change and the rope behaves more like a rigid material. A graph illustrates the change in form of the load elongation curve with loading. This tends to lose the constructional phase of elongation as the load becomes of greater magnitude. The effect of weather is (*a*) fibre degradation, causing loss in strength, and (*b*) conversion of the rope structure with a construction looseness as a result of alternate wetting, drying, stretching, *etc.* The looseness affects the elongation. L—**5B.**

(C)—FABRICS

Cotton Knitted Underwear Fabrics: Factors Affecting Relaxation Shrinkage. L. I. Weiner. *Amer. Dyes. Rept.*, 1950, **39**, 241-248. The author has studied the effects of variable factors in knitting and finishing on the shrinkage of cotton

underwear tubing. Four methods for evaluating the relaxation shrinkage are briefly described. The following factors were investigated: yarn count, conditions of yarn manufacture, knitting stiffness and stitch type, wet finishing, calendering and pre-shrinking. The data are discussed. Through a combination of optimum knitting and finishing conditions it is possible to reduce the potential shrinkage of underwear to as much as one-half. C—**5C.**

Flame-proofing Agents: Catalytic Effect on Degradation and Oxidation of Cellulose. W. G. Parks, J. G. Erhardt and D. R. Roberts. *Amer. Dyes. Rept.*, 1950, **39**, 294-300. The catalytic decomposition of cellulosic material and the effect of various possible flame-retardant reagents on the reactions involved were investigated. The rate and mechanism of the oxidation of cellulose were studied on the basis of the products of the reaction in the presence of various catalytic substances. The volumes of carbon dioxide and monoxide, and the quantity and composition of the charred and terry products formed were determined. Experimental data are given for 49 flame-proofing agents. C—**5C.**

Textile Fabrics: Singeing Temperature. ("Der Maximal-Wärmegrad für Textilien.") K. Gapp. *Kunstseide u. Zellwolle*, 1949, **27**, 364. The temperatures at which singeing and charring or softening take place for 15 textile fabrics (all types of fibre) are shown on a diagram. C—**5C.**

Warp and Weft Shrinkage Determination Apparatus. ("Appareil de mesure de l'embruage et du retrait des fils tissés.") Jean Henno and Robert Jouhet. *Bull Institut Textile, France*, 1950, No. 17, 57-58. An apparatus for determining warp and weft shrinkage on the crimped yarns taken from the woven fabric is briefly described and illustrated schematically. C—**5C.**

Cotton Fabrics: Effect of Finishing Processes on Dimensions and Other Properties. ("Loss of Weight in Kier-boiling, Width Contraction in Bleaching and Length Increase in Finishing-calendering Processes.") N. H. Shah. *Indian Textile J.*, 1950, **60**, 492-495. The effects of bleaching and finishing processes on certain properties of cotton materials have been investigated. Four processes of the same plan but differing in certain details were used, and their respective effects on the grey width, length and weight of the cloths were recorded. Variations in count, tensile strength and twist were noted. In particular, results are presented for length, width and weight changes taking place at the bleaching, finishing and calendering stages. Changes due to scouring and kier-boiling processes are briefly discussed. C—**5C.**

Cotton Fabrics: Moisture Absorbency. E. M. Buras, C. F. Goldthwait and Rita M. Kraemer. *Textile Research J.*, 1950, **20**, 239-248. A test method for the measurement of the absorbency of cotton fabrics is described. The fabric is wetted quickly from one side while it is under pressure. A glass filtering funnel provides a wet porous plate (on to which the sample is pressed) and rates of flow of water through the plate are measured by means of a flow-meter. Both rate of absorption and total or ultimate absorption may be evaluated by this method. Absorbency relationships involved and the experimental procedure are discussed. The theory of the absorption mechanism is briefly explained. C—**5C.**

Degraded Textile Materials: Sampling. ("Sampling in Relation to Specifications Concerning the Degradation of Textile Materials.") H. P. Stout. *J. Textile Institute*, 1950, **41**, T145-T150. A statistical treatment is developed for the problem of selecting a satisfactory number of samples of a degraded textile material for strength tests. An equation is derived which enables the necessary number of tests to be determined for any specified risks, and any values of the acceptance and rejection levels. The application of the method to the preparation of a specification for a degraded material is discussed. C—**5C.**

Fabrics: Impact of Raindrops on —. Marianne Kärrholm and Gunnar Kärrholm. *Textile Research J.*, 1950, **20**, 215-226. The pressure/time relationships existing during the impact of water on fabric surfaces have been studied. The impact was recorded by a high-speed motion-picture camera. A mathematical treatment of the impact is given, dealing with the pressure exerted by the water drop, the depth of penetration, and the manner in which the drop deforms during impact. For water repellency a plain fabric must have very small pores on the fabric surface and must be made highly compressible (*e.g.* raised fabrics) to reduce the pressure exerted by the rain drops. C—**5C.**

Fabrics: Setting Calculations. ("Über die Berechnung der Fadendichte eines Gewebes.") Günther Satlow. *Textilberichte*, 1949, **30**, 449-451. It is shown that the calculation of setting according to Wiechmann[1] on the basis of yarn diameter does not correspond to actual conditions. The maximum setting can only be approximately calculated by taking into consideration the specific gravity of the yarn (about 0·688 g/c.c. for cotton), the possible compression of cotton warps by about 10 per cent. and of cotton wefts by about 25 per cent. (according to F. W. Kuhn), and the least possible distance between two threads on the basis of yarn position in the fabric structure. On such considerations the limit of setting is almost reached and may only be slightly exceeded in practice, whereas that limit is already exceeded by the Wiechmann method of calculation. ([1]*J. Textile Institute*, 1948, **39**, A605.) C—**5C.**

Rayon Mixture Fabrics: Wear Properties. ("Hoe veranderen de gebruikseigenschappen van bepaalde weefsels (tricotgoederen), wanneer daarin katoenen (en/of wollen) garen door rayon vezelgaren wordt vervangen?") W. Werker. *Meded. Vezelinstituut T.N.O.*, 1949, No. 94 I, 3-15, No. 94 II, 3-11. An investigation has been carried out to determine the alteration in wear properties of certain woven fabrics (serges, corset-materials, flannels, shirtings, *etc.*) and of tricot fabrics when cotton and/or woollen yarns are replaced by rayon staple yarn. The materials investigated are described and the conclusions drawn are discussed separately for each kind of fabrics. The experimental results are summarised in ten tables. C—**5C.**

Textile Fabrics: Soiling Tendency Test. ("Étude de l'aptitude des tissue à la salissure.") Jean Henno and Robert Jouhet. *Bull. Institut Textile France*, 1950, No. 17, 63-65. A method for soiling fabrics under controlled conditions and the evaluation of soiling is suggested. Dust is deposited on the sample by means of a carefully regulated current of air. The amount of dust retained (that remaining after the excess has been shaken off) is determined photometrically by comparison with a sample of the original clean fabric. C—**5C.**

Textile Materials: Informative Labelling. R. Wallis. *Brit. Rayon and Silk J.*, 1950, **26**, May, 82-83. The writer discusses the identification of the composition of textile articles by informative labelling. Such labelling would benefit the customer and the dry cleaner. C—**5C.**

Cotton Dyeings: Fastness to Mercerisation. ("Bestimmung der Mercerisierechtheit von Färbungen.") Swiss Society for Testing Technical Materials. *Textil-Rundschau*, 1950, **5**, 99. The test is given of the Swiss standard method SVMT 25, A 2561 for testing the fastness to mercerisation (5 minutes at 15° to 20° C. in 23·5 per cent. NaOH) of dyed cotton yarns or fabrics. C—**5C.**

Dyed and Printed Textiles: Microscopy. G. L. Roger. *A.S.T.M. Bull.*, 1950, No. 165, 46-48. The applications of microscopy to the study of chemical phenomena and in the dyeing and finishing of textiles are briefly discussed. The various types of microscope (including the biological, phase, and electron microscopes) are mentioned and their particular uses are indicated. The microscope is useful in studying levelness of dyeing and the degree of penetration of the colour in printing. Microscopy has also been applied to finishing, *e.g.* in examining the location of shrink- and crease-resisting agents in the fibre and fabric. C—**5C.**

Dyeings: Light Fastness Determination; Present Position. ("Der heutige Stand der Bestimmung der Lichtechtheit.") Paul Rabe. *Textilberichte*, 1949, **30**, 470-472. Methods in use at present in Germany and in other countries for the determination of the light fastness of dyeings are discussed. The method considered best is the comparison with a standard scale, and the need for an international scale is pointed out. C—**5C.**

Dyeings and Prints: Fastness to Brightening. ("Bestimmung von Avivierechtheit von Färbungen und Drucken.") Swiss Society for Testing Technical Materials. *Textil-Rundschau*, 1950, **5**, 65. Details are given of the Swiss standard method SVMT 25, A2544, for testing the fastness of dyed and printed textiles to brightening, a lactic acid solution being used as the test agent. C—**5C.**

Textile Prints and Dyeings: Fastness to Ironing. ("Bestimmung der Bügelechtheit von Färbungen und Drucken.") Swiss Society for Testing Technical Materials. *Textil-Rundschau*, 1950, **5**, 64. Particulars are given of the

Swiss standard method SVMT 25, A 2532, for determining the fastness to dry and wet ironing of dyed and printed textiles. C—**5C.**

Wool and Silk Dyeings and Prints: Fastness to "Sulphur". ("Bestimmung der Schwefelechtheit von Färbungen und Drucken.") Swiss Society for Testing Technical Materials. *Textil-Rundschau*, 1950, **5**, 66. Particulars are given of a Swiss standard method, SVMT 25, A 2574, for determining the fastness to "sulphur" of wool and silk, that is, fastness to the sulphur dioxide atmosphere established by burning sulphur. C—**5C.**

(D)—Other Materials

Paper: Dielectric Constant Calculation. R. Goldschmidt. *Helv. Phys. Acta*, 1949, **22**, 623-626 (through *Chem. Abstr.*, 1950, **44**, 3756[8]). On the assumption of two components for a heterogeneous material like paper, a resulting dielectric constant is defined that depends on a form factor, the percentage composition, and the dielectric constants of the components. A method for obtaining the dielectric constant for such cases is described. C—**5D.**

Plastic Materials: Measurement of Dynamic Mechanical Properties. L. E. Nielsen. *A.S.T.M. Bull.*, 1950, No. 165, 48-52. Two types of apparatus for the measurement of the dynamic mechanical properties of plastic materials are the torsion pendulum (by which a shear modulus and damping term are obtainable) and a resonating reed vibrator (which can be used to calculate a Young's modulus of elasticity and mechanical damping for rigid films or fibres). The construction and operation of each apparatus are briefly given and the theory of each method is indicated. Some applications of the methods are mentioned. C—**5D.**

7—LAUNDERING AND DRY-CLEANING

Detergents: Electrophoretic Mobility and Suspending Power. J. M. Doscher. *J. Colloid Sci.*, 1950, **5**, 100-103. Measurements of the electrophoretic mobility of cellulose in solutions of cationic surface-active agents, have been carried out by means of a micro-electrophoretic cell. Experiments have also been made on the mobility of carbon blacks suspended in Hyamine solutions. The data strongly suggest that it is not the change in zeta-potential which gives rise to suspendability or detergency, but whether or not the detergent can be adsorbed on dirt and fabric, in ionised or non-ionised form, and the resulting nature of the exposed surfaces, whether hydrophobic or hydrophilic. C—**7.**

Detergents: Testing. K. Tomlinson. *Mfg. Chem.*, 1949, **20**, 477-480 (through *Brit. Abstr.*, 1950, B II, 251). Methods of measuring detergent power are assessed and their application to synthetic detergents is described. Such tests include wetting, loosening, emulsifying and suspending powers, and lather formation. Interfacial tension against oil and suspending power are probably sufficient to assess the value of most detergents. C—**7.**

Soap: Sorption by Textile Fibres. A. S. Weatherburn, G. R. F. Rose and C. H. Bayley. *Canadian J. Res.*, 1950, **28F**, 51-61. The sorption of the Na soaps of lauric, myristic, palmitic, stearic and oleic acids from aqueous solutions at 70° C. by various textile fibres has been measured. Cotton and viscose rayon show a preferential sorption of alkali with all of the soaps, whereas cellulose acetate rayon, nylon and wool preferentially take up fatty acid with lower molecular weight soaps and alkali with the higher soaps. In order of increasing sorption of fatty acid and alkali the fibres may be arranged as follows: cotton, nylon, cellulose acetate rayon, bright viscose rayon, dull viscose rayon, and wool. The data lead to the conclusion that the sorption of soap by textile fibres is a complex process involving the more or less independent sorption of neutral soap, hydrolytic fatty acid, and hydrolytic alkali. There are 28 references to the literature. C—**7.**

Nylon Fabrics: Application in the Laundry Industry. Geoffrey Farrington. *Brit. Rayon and Silk J.*, 1950, **26**, April, 67. Some uses for nylon fabrics in the laundry industry which are being tried out are briefly mentioned and a selection of fabrics are illustrated. These include knitted and woven press padding, laundry bags and calender guide tape. C—**7.**

Alkyl Aryl Sulphonate Detergents: Effect of "Builders". R. C. Merrill and Raymond Getty. *Ind. Eng. Chem.*, 1950, **42**, 856-861. Experimental data are reported on the detergent properties of two typical alkyl aryl sulphonate detergents with the inorganic "builders" sodium carbonate, trisodium phosphate,

tetrasodium pyrophosphate, and certain sodium silicates. Sodium silicates and phosphates are more effective than sodium carbonate or hydroxide in preventing the deposition of iron oxide, ilmenite black and raw umber on cotton cloth. For a variety of soiling media synthetic detergent-alkaline builder mixtures give as good as or better detergency than synthetic detergents alone, and at lower cost. C—7.

Detergents: Evaluation. W. K. Griesinger and J. A. Nevison. *J. Amer. Oil Chemists' Soc.*, 1950, **27**, 96-100 (through *Chem. Abstr.*, 1950, **44**, 4269[f]). A typical launderometer procedure has been used for the evaluation of detergents based on a homologous series of alkyl aryl sulphonates. White Oxford cloth is soiled with a special mixture, dried, cut into swatches, and the reflectance read on a photometer. The soiled swatches are treated with various concentrations of detergents in the launderometer. The swatches are rinsed, dried, and their reflectance is again measured, and the detergency values are calculated. Detergency = per cent. reflectance regained = 100 × (reflectance, washed swatch—reflectance, soiled swatch)/(reflectance original swatch—reflectance, soiled swatch). C—7.

Fabrics: Soiling; Nature of Dirt and Methods of Retention at the Surface. F. D. Snell, Cornelia T. Snell and Irving Reich. *J. Amer. Oil Chemists' Soc.*, 1950, **27**, 62-68 (through *Textile Techn. Digest*, 1950, **7**, 301). Soiling material is usually composed of various amounts of oil, wax, or grease, solid particles of diverse types, and special water-soluble or water-dispersible materials such as sugar, salts, starch, *etc.* Dirt is retained on fabrics by mechanical forces, electrostatic attraction, and oil-bonding. C—7.

Ion-active and Non-ionic Detergents: Development. ("Zur Theorie und Praxis der ionogenaktiven und ionogeninaktiven seifenartigen Stoffe.") Conrad Schöller. *Textil-Rundschau*, 1950, **5**, 77-92. Some points raised in a paper by Chwala[1] are discussed in greater detail under the following headings: (i) Ion-active character of non-ionic polyglycol ethers; (ii) Transitions of non-ionic compounds to the anion- and cation-active groups; (iii) Variants of polyglycol ethers; (iv) Non-ionic compounds with accumulated hydroxyl groups; (v) Cation-active soap-like compounds; (vi) Influence of constitution on the properties of soap-like compounds; (vii) Influence of hydrophilic groups on the properties of soap-like compounds; (viii) Dependence of the properties of soap-like compounds on the state of aqueous solutions; (ix) Influence of electrolytes added to the aqueous solutions of soap-like compounds on their efficiency; (x) Ionisable amino groups as hydrophilic residues; and (xi) The practical importance of soap and synthetic textile auxiliaries in relation to their specific properties. ([1]*J. Textile Institute*, 1947, **38**, A521.) C—7.

Soaps and Soap-like Detergent Aqueous Dispersions: Structure. ("Die wässrigen Dispersionen von Seifen und seifenartigen Stoffen.") A. Chwala. *Textilberichte*, 1949, **30**, 459-461. A report of a lecture in which the author discusses the multiplicity of soap-like surface-active detergents and then deals with the four characteristic stages of the aqueous dispersions of the various products: (i) stage of the single ions or single molecules in very dilute solutions (about 0·006 N at C_{12} to 0·0003 N at C_{18}); (ii) stage of the "premicelles" with low association in the ranges 1 to 10 g./litre according to the length of the carbon chain; (iii) stage of the solution region which already has a lattice arrangement, but is at the same time solvatised, with about 1 to 50 per cent. active substance; (iv) stage of non-solvatised crystallites as they occur in water-free substances or in concentrations with more than about 50 per cent. active substance. The second stage, which is particularly important for the theory and practice of detergents and textile auxiliaries, is discussed in some detail. C—7.

Dry Cleaning Processes. G. P. Fulton and A. E. Johnson. *Papers Amer. Assoc. Textile Techn.*, 1950, **5**, 85-97. Brief details of the National Institute of Cleaning and Dyeing (of America) are given, followed by a description of the processes used in the dry-cleaning industry. A full report of a discussion on the paper is given. C—7.

Detergents: Modern Trends in the Use of —. P. B. Law. *Text. J. Australia*, 1950, **25**, 189-192. A lecture, in which detergency is discussed. Details are given of the advantages of carboxymethyl cellulose (marketed as Tylose HBR and as Cellofas B and Cellofas C) for improving the detergency of both surface active agents and soap used for laundering cotton. W—7.

PATENTS

Centrifugal Clothes Drying Machine. G. W. Smith. B.P.629,796 of 2/12/1947: 28/9/1949 (Conv. 9/12/1946). A centrifugal drier of known type is fitted in a recessed central portion of the base with a driving turbine the vanes of which are so designed that a smaller than usual jet of fluid is sufficient motive power. C.

Dry Cleaner's Spotting Board. Isaac Braithwaite & Son, Engineers, Ltd. and R. E. English. B.P.629,826 of 10/10/1947: 29/9/1949. A steam spotting board is hinged about midway along its length on a suitable stand, one end is connected to the valve that controls the steam supply to the spotting gun, and the valve can be actuated by hand pressure on the other end. A pedal is also provided as alternative means for operating the valve. C.

Dry-Cleaning Solvent: Composition. H. W. Kay. B.P.630,278 of 19/2/1947: 10/10/1949. The claim is for the addition of an emulsified paraffin to a dry-cleaning solvent. A typical emulsion is the creamy paste obtained by mixing white spirit or light spindle oil (12 parts), tri-ethanolamine (1), higher fatty acid or glyceride (1) and water (10). One pint is added to 50 gallons of dry-cleaning solvent of the type of trichloro-ethylene. C.

8—BUILDING AND ENGINEERING

(C)—STEAM RAISING AND POWER SUPPLY

Back-pressure and Pass-out Turbines: Application ("Power from Process Steam.") A. E. Williams. *Textile Mercury & Argus*, 1950, **122**, 926-932. An illustrated account is given of four classes of turbine—back pressure, pass out-back pressure, pass-out and mixed pressure—that provide combined power and heating steam. C—**8C.**

Textile Mill Boiler Plant: Selection. S. D. Scorer. *Textile Manufacturer*, 1950, **76**, 247-250. Various points are discussed for the guidance of mill-owners in the selection of boiler plant. The factors dealt with include evaporating capacity, nature of steam demand, steam pressure, type of boiler, number of boilers required, efficiency, fuel characteristics, and coal handling methods. C—**8C.**

Fibrous Glass Insulation: Application. W. Oburger. *Elektrotech. u. Maschinenbau*, 1949, **66**, 192-195 (through *Electr. Engng. Abstr.*, 1949, **52**, 492). A short account is given of the properties, manufacture, and applications of fibrous glass insulation for electrical machines. The effect of impregnation of the glass fibres with various compounds on the working temperature limit is indicated. The advantages of fibrous glass insulation include higher insulation resistance, breakdown strength, temperature stability, resistance to moisture, good thermal conductivity and mechanical strength with higher flexibility. C—**8C.**

(D)—POWER TRANSMISSION

Ball-bearing Race: Failure Due to Friction Oxidation. ("Anti-friction Bearings demand High-quality Lubricants.") C. A. Berg. *Textile World*, 1950, **100**, No. 5, 97, 325-328. The simultaneous oxidation of grease and metal which occurs when ball bearings are subject to small-angle oscillating motion rapidly causes the failure of the race. Test apparatus and sample ball races are shown. The adverse effects of high temperature drying processes on lubrication are briefly considered. C—**8D.**

Finishing Range Driving Motors: Selection. ("Many Factors Govern Range-drive Selection.") C. V. Topliffe. *Textile World*, 1950, **100**, No. 5, 88-91, 303-312. Factors governing the selection of electric motors (d.c.) for driving textile finishing ranges are discussed. The relative merits of field control (constant voltage) and adjustable voltage motors are considered. C—**8D.**

(E)—TRANSPORT

Knitted Outerwear Plant Materials Handling Systems. ("Assembly Line Principle Utilized in Knitted Outerwear Plant.") *Textile Industries*, 1950, **114**, No. 4, 221-226. An overhead conveyor system for finished goods, installed in an American knitting mill, is described and illustrated. The system serves four floors and carries goods eventually to the storage and dispatching departments. C—**8E.**

Belt Conveyors. H. Streets. *Practical Engng.*, 1950, **21**, 463-465; 492-493. A general discussion of belt conveyors deals with types of belts, maximum number of plies, determination of width of belt, and the calculation of power

required to drive conveyors. Tables of relevant data are given. Other topics discussed include the avoidance of excessive impact, skirt plates, the use of scrapers, and ply separation. C—**8E.**

Scutcher Lap Handling System. ("Lap-handling System Meets Unusual Demand.") E. D. White. *Textile World*, 1950, **100**, No. 5, 92-93. An overhead conveyor system for the transport of laps from the blowroom to the card rooms is briefly described. A special feature is the automatic separation (by means of a photo-electric device) of long- and short-staple laps. C—**8E.**

(G)—Heating, Ventilation and Humidification

Dyeing and Finishing Plant Mist Dispersal Systems. ("Entnebelungsanlage im modernen Färberei- und Ausrüstungsbetrieb.") Jos. Schneider. *Kunstseide u. Zellwolle*, 1949, **27**, 396-399. The causes of the formation of visible fog in dyeing and finishing plants are reviewed and clearing systems based on a change of air produced by either over- or under-pressure are discussed. A table is reproduced that indicates the volume of air, horse-power and steam required for a 60-100° C. range of temperatures of the mist producing system. C—**8G.**

Industrial Stoving Ovens. J. N. Taylor. *Gas Heat in Industry*, 1949, 258-264. Conclusion of a previous paper,[1] dealing with radiant heat (infra-red) conveyor ovens. ([1]*J. Textile Institute*, 1950, **41**, A356.) C—**8G.**

Air-borne Dust: Sampling. ("Use of Filter Paper for Collecting Aerosols.") H. G. Bourne and L. P. Streett. *Paper Trade J.*, 1950, **130**, No. 19, 21-24. Desirable properties of filter papers for mist, fume and dust sampling are mentioned and an investigation to determine the most suitable paper is briefly reported. Data are presented on the air resistance and collecting efficiency of various filter papers. A thick, bulky, low-resistance filter paper proved highly efficient for the sampling of air-borne mist and dust. C—**8G.**

Dust Collector for Cleaning Small Motors. Dallow Lambert & Co. Ltd. *Ind. Chemist*, 1950, **26**, 227. A complete portable unit is announced for the removal of dust from electric motors and other small units. Dust blown out of the motor by compressed air is collected under a suction hood by means of a "Drymat" unit. C—**8G.**

Thermo-electric Psychrometer. ("Recherches sur la mesure hygrometrique de l'air.") Maurice Valet. *Bull. Institut Textile France*, 1950, No. 17, 47-54. The theory of a thermo-electric psychrometer is developed in which the deviation of a galvanometer is proportional to the degree of humidity of the surrounding air, *i.e.* direct readings are possible. The construction of such a hygrometer is briefly described. It consists of six copper/constantan thermocouples, three of which are placed in the atmosphere to be measured and the other three kept moist. Good performance is reported. C—**8G.**

(I)—Waste Disposal

Cotton Finishing Works Waste Liquors: Treatment. G. G. Bogren. *Ind. Eng. Chem.*, 1950, **42**, 619-621. All the waste liquors from a large cotton finishing plant were treated by subsidence and about 15 per cent. by subsequent trickling filtration through crushed stone and intermittent filtration through a fine cinder filter. The methods are described. Experiments with a pilot plant having high-rate trickling filters were conducted in an attempt to find a more complete treatment for the waste liquors so as to abate stream pollution. Results were satisfactory. Data are given for analyses of wastes and treated effluents. C—**8I.**

Cotton Printing and Finishing Works Wastes: Treatment. S. E. Coburn. *Ind. Eng. Chem.*, 1950, **42**, 621-625. A pilot plant was operated during 1948 to find the most feasible method of treating cotton printing and finishing wastes before discharge into the Delaware River. High-rate trickling filters presented fewer complications in operation and a less serious sludge-disposal problem than a chemical treatment plant. Results are given of analyses of wastes and treated effluents under varying operating conditions, and estimated costs of constructing and operating a plant to handle 2,000,000 gallons a day. C—**8I.**

Patents

Atomizer-type Humidifier. William Feldermann. B.P.629,697 of 5/6/1947: 26/9/1949 (Conv. 7/10/1944). The invention relates to a humidifier unit which is fitted with baffles to prevent large drops of water from emerging in the stream of air and atomized water. C.

Sterols: Recovery. N. V. Veenendaalsche Sajet- en Vijfschachtfabriek Vorheen Wed. D. S. van Schuppen & Zoon. B.P.636,299 of 26/4/1950. Sterols are recovered by treating sterol-containing material with at least a four-fold excess of anhydrous zinc chloride in an organic solvent, separating the sterol-zinc chloride addition compound, and reconverting it into sterol. Examples are given of the recovery of sterols from various substances, *e.g.* wool wax alcohols. W.

Production of Sterols and their Addition Products. N. V. Veenendaalsche Sajet- en Vijfschachtfabriek, Vorheen Wed. D. S. van Schuppen & Zoon. B.P. 638,393 of 7/6/1950. Sterol-containing material, *e.g.* wool fat alcohol, is treated with aliphatic compounds containing one or more amino groups or their salts, preferably urea or its salts. The addition products thus formed are separated, and if desired, decomposed to obtain the sterols. W.

9—SCIENCE

Colloid Particles: Small-angle X-Ray Scattering. Otto Kratky and Günther Porod. *Acta Phys. Austriaca*, 1948, **2**, 133-147 (through *Chem. Abstr.*, 1950, **44**, 904[1]). Colloid particles give X-ray interference effects that are characteristic only of the individual particles provided they are of similar size and form and also randomly dispersed in a dilute solution. A quantitative relation can be deduced between particle dimension and angular range of X-ray scatter. Different methods of determining particle form are discussed, and an exact method is described for calculating the scattering curve for particles of any arbitrary form. Comparison with the experimental curve permits the choice of the best form. Spherical particles show a variation of scattered intensity with $1/\theta$; infinitely extended chains of spheres give a variation with $1/\theta$ plus added intensity steps if periodicities are present; infinite sheets of spheres give a variation with $1/\theta^2$. C—**9.**

Proteins: X-Ray Diffraction Investigation. O. Kratky. *Monatshefte für Chemie*, 1947, **77**, 224-250 (through *Chem. Abstr.*, 1950, **44**, 1149[4]). A comprehensive review under (1) fibres, (2) single crystals, and (3) protein solutions. Protein fibres can be classified into the keratin-myosin and collagen groups. A detailed discussion is given of the present state of knowledge of the α-, β-, and super-contracted keratin structures, of which the β- form is known in most detail. Features of the collagen structure as deduced from large- and small-angle diffraction studies of kangaroo tail tendon are presented. A description is given of the application of conventional diffraction methods to the analysis of single crystals of hæmoglobin and tobacco mosaic virus, and a summary of the resulting structural information is included. Present knowledge of the sizes and shapes of particles in colloidal solution as found from low-angle scattering studies is summarised, and the results are compared with information obtained with the electron microscope and ultracentrifuge. There are 53 references to the literature. C—**9.**

Linear and Polynomial Regression Analysis: Rank-invariant Method. H. Theil. *Proc. Kon. Ned. Akad. Wet.*, 1950, **53**, 386-392. Confidence regions have been obtained for the parameters of linear regression equations in two variables without assuming normality. C—**9.**

Partial Differential Equations: Solution with a Resistance Network Analogue. G. Liebmann. *Brit. J. Applied Physics*, 1950, **1**, 92-103. Resistance networks are capable of very high accuracy in the solution of partial differential equations with given boundary conditions. A suitable network for this purpose is of the axially symmetrical type, with 60 meshes in the z-direction and 20 meshes in the r-direction, and it is surrounded by a termination strip. Fifty current feeding points for adjusting boundary conditions are provided. In tests of the accuracy obtained the network is shown to be superior to the electrolytic tank. C—**9.**

Cellulose-destroying Fungus Memnoniella Echinata: History, Distribution and Economic Significance. W. L. White, C. C. Yeager and Helen Shotts. *Farlowia*, 1949, **3**, 399-423 (through *Rev. Appl. Mycol.*, 1950, **29**, 166). Information collected during 1947 indicates that *Memnoniella echinata* is a tropical species. Its occurrence in temperate regions is sporadic and observations have established conclusively that materials become infested only after being trans-

ported to the tropics. In nature *M. echinata* attacks the purest forms of cellulose, *e.g.* cotton materials and paper. Untreated fabrics in transit and storage are those damaged primarily, especially when they are allowed to become moist with rain. The organism thrives best in moist, dark habitats where air circulation is limited but not prevented completely. C—**9.**

Kjeldahl Ultramicro-determination Apparatus: Industrial Applications. J. A. Kuck, Alma Kingsley, Doris Kinsey, Frances Sheehan and Gladys F. Swigert. *Anal. Chem.*, 1950, **22**, 604-611. An illustrated description is given of procedures for determining nitrogen on the ultramicro-scale in nitrate solutions and nitro compounds (after reduction by Devarda's alloy) and in research preparations. Descriptions are given of distillation apparatus and the Carlsberg equipment, including the Kirk ultramicro-burette. C—**9.**

Polarographic Cell for Routine and Research. G. S. Smith. *Analyst*, 1950, **75**, 215-218. A flow-through type of polarographic cell embodies an external anode with a simple liquid junction, provision for de-oxygenation of electrolytes in the absence of mercury, and means for determining the capillary characteristics. C—**9.**

Calcium in Plant Tissues: Colorimetric Micro-determination. A. J. McGregor. *Analyst*, 1950, **75**, 211-215. Calcium is extracted from fresh or dried plant material by an acetate reagent and precipitated as oxalate. The washed and centrifuged precipitate is used to reduce the red colour of a standard ferric thiocyanate solution. The decrease in intensity of colour, measured absorptiometrically, is proportional to the calcium content of the extract. Magnesium does not interfere. C—**9.**

Fabricated Polyvinyl Chloride: Iron, Copper, Lead and Mercury Content; Determination. W. T. Rees. *Analyst*, 1950, **75**, 160-166. Sensitive methods for the determination of microgram quantities of Fe, Cu, Pb and Hg have been adapted to the analysis of polyvinyl chloride plastics for use in contact with pure hydrogen peroxide. The methods described require the use of a filter absorptiometer or a spectrophotometer. An efficient wet oxidation procedure is described. Particular attention has been given to the preparation of the sample for the determination of mercury and special distillation apparatus has been designed to avoid the loss of the metal during digestion. Typical results are given. C—**9.**

Hydrogen Peroxide: Spectrophotometric Determination. T. C. J. Ovenston and W. T. Rees. *Analyst*, 1950, **75**, 204-208. A precise method for the determination of microgram quantities of hydrogen peroxide in neutral aqueous solutions is described. Iodine is liberated from potassium iodide, with ammonium molybdate as catalyst, and determined by measurement of the absorption of the periodide ion at a wavelength of 353 $m\mu$. The sensitivities of the periodide and starch-iodine methods for the absorptiometric determination of liberated iodine are compared. C—**9.**

Sulphuretted Hydrogen: Colorimetric Determination. C. G. Ethrington, D. Warren and F. C. Marsden. *Analyst*, 1950, **75**, 209-211. A method for the determination of H_2S in effluent gases that may also contain SO_2 and CS_2 (*e.g.* from a viscose factory) consists in absorbing the gas in ammonium arsenite solution buffered by Na acetate/acetic acid to *pH* 5 and containing gelatin as protective colloid and measuring the colour by means of a Spekker absorptiometer calibrated against a set of arsenious sulphide sols. At *pH* 5 the SO_2 does not interfere. C—**9.**

Amino Acids and Peptides: Chromatographic Separation. ("Les acides aminés individuels de l'insuline avec une note sur le dosage de la proline.") Roger Acher, Claude Framageot and Marian Jutisz. *Biochim. Biophys. Acta*, 1950, **5**, 81-88. The composition of insulin has been determined by a method in which the amino acids are separated by paper chromatography into basic, acid, neutral aromatic and neutral non-aromatic groups. Each amino acid in each group has been determined. Results are in excellent agreement with those obtained by previous workers using different methods, except for glutamic acid, leucine and proline. A method for the chromatographic determination of proline is given in which isatin is used as developer instead of ninhydrin. From the results an empirical formula for insulin is derived. The molecular weight of an insulin

element is calculated from the number of nitrogen atoms and compared with that calculated from the number of amino acid residues; there is close agreement. C—9.

Amino Acids: Paper Chromatography. L. Fowden and J. R. Penney. *Nature*, 1950, **165**, 846-847. The most sensitive and accurate method for the determination of amino-acids in complex mixtures by paper chromatography is a colorimetric ninhydrin method based on that of Moore and Stein.[1] The effect of initial concentration, distance flowed, and drying on recovery of alanine in this method has been studied, with phenol-ammonia and *n*-butanol-acetic acid as solvents. Typical results are presented. ([1] *J. Textile Institute*, 1949, **41**, A73.) C—9.

Benzene Hexachloride: Determination by an Ultra-violet Spectrophotometric Method. Bernard Davidow and Geoffrey Woodard. *J. Assoc. Offic. Agric. Chem.*, 1949, **32**, 751-758. A method for the determination of benzene hexachloride is based upon conversion to 1:2:4-trichlorobenzene and estimation of this with an ultra-violet spectrophotometer. Experimental data are given. C—9.

Organic Nitrogen: Ultramicro-determination. W. L. Doyle and J. H. Omoto. *Anal. Chem.*, 1950, **22**, 603-604. In a modified micro-Kjeldahl procedure a two-step digestion process is used to avoid bumping and the distillation tubes are coated with silicone in place of paraffin. The ammonia is received in KH_2 phosphate and titrated with acid at *pH* 4·6 and bromocresol green as indicator. Consistent results have been obtained in the range 0·5 to 5 μg N. C—9.

Surface-active Agents: Colorimetric Determination. G. R. Wallin. *Anal. Chem.*, 1950, **22**, 616-617. At an acid *pH* basic fuchsin reacts quantitatively with dodecylbenzene sodium sulphate, giving on shaking with chloroform a magenta-coloured extract which may be measured in a photo-electric colorimeter. This reaction is used in a simple, accurate method for the determination of surface-active agents. An abridged spectrophotometric curve is shown for the chloroform-soluble complex. C—9.

Cellulose: Solubility in Radio-active Sodium Zincate. Karl Borgin. *Norsk. Skogindustri*, 1949, **3**, 96-103 (through *Chem. Abstr.*, 1950, **44**, 3249[i]). After a brief review of present opinions on the solubility of cellulose in different agents, an outline is given of the author's investigation on the action of sodium zincate. By using in part radio-active zinc in the zincate and ordinary tracer technique, the results showed that the compound between cellulose and sodium zincate is neither homopolar nor ionic but is held together by hydrogen bonds or dipole-dipole forces. C—9.

Jute α-Cellulose: Composition. ("Association of Xylan with α-Cellulose in Jute.") P. B. Sarkar, A. K. Mazumdar and K. B. Pal. *Nature*, 1950, **165**, 897-898. Jute α-cellulose has been hydrolysed by means of 72 per cent. sulphuric acid and the products have been subjected to paper chromatography, with *n*-butyl alcohol, acetic acid and water as solvent and glucose and xylose as reference sugars. On fixation of the chromatogram with ammoniacal silver nitrate and also with aniline hydrogen phthalate no spot corresponding to xylese was observed. C—9.

Wood and Lignin-Cellulose Complex: Reaction with Mineral Acids. F. A. Abadie. *Norsk. Skogindustri*, 1949, **3**, 290-294 (through *Chem. Abstr.*, 1950, **44**, 3249[e]). The green colour that appears when wood flour is treated with strong mineral acids appears to be due to a lignin-carbohydrate complex, as first explained by Hägglund. The fraction insoluble in acetone that results from nitrating semi-chemical pulp, previously identified as a lignin-carbohydrate complex, also gives the green colour. The colour reaction should have practical significance as a simple test for the estimation of the extent to which carbohydrates are bound to lignin in such pulps. C—9.

Amino-acids: Preparation; Application of Displacement Chromatography. S. M. Partridge. *Chemistry & Industry*, 1950, 383-386. A review is given of work done on the application of displacement chromatography as a preparative scale procedure for amino-acids, using columns packed with synthetic ion-exchangers. Experimental data are included. C—9.

Gelatin: Structure and Constitution. Jacques Pouradier and Marcel Abribat. *Science et inds. phot.*, 1949, **20**, 444-448 (through *Chem. Abstr.*, 1949, **44**, 2332[d]). The gelatin molecule is a long polypeptide chain structure and not a network.

It is coiled at its iso-electric point and extended at other *p*Hs because of repulsion by similarly charged groups. Gelatin in solution is molecularly dispersed. C—9.

Protein Molecules: Fine Structure and Physical-chemical Behaviour. G. Scheibe. *Naturwissenschaften*, 1948, **35**, 168-175 (through *Chem. Abstr.*, 1950, **44**, 2332[d]). A review, dealing with the structure of proteins, the spatial arrangement of the building units, the bonds of the dipole molecules, energy conduction in protein molecules, *etc.* C—9.

Aromatic Nitro Compounds: Indirect Preparation. H. H. Hodgson, F. Heyworth and E. R. Ward. *J. Soc. Dyers & Col.*, 1950, **66**, 229-231. A review is given of methods other than direct nitration for the preparation of aromatic nitro compounds. There are 39 references to the literature. C—9.

Dihydroxyadipic Acid and Hexamethylenediamine: Polycondensation. G. Beauvalet and G. Champetier. *Bull. Soc. Chim. France*, 1949, 636-641 (through *Chem. Abstr.*, 1950, **44**, 2792[c]). α:α'-Dihydroxyadipic acid on polycondensation with hexamethylenediamine forms a polyamide containing free hydroxyl groups. These are capable of developing hydrogen interactions among the macromolecules and, on heating, forming ether bridges, giving a three-dimensional polyamide network. The mechanism of the polycondensation has been established by measuring conductivity changes of the reaction medium, by X-ray diffraction of the polymer, and by its mechanical properties. C—9.

High Polymers: Fractional Precipitation. L. de Brouckère, E. Bidaine and A. van der Heyden. *Bull. Soc. chim. Belg.*, 1949, **58**, 418-419 (through *Brit. Abstr.*, 1950, C, 93). The solvent is best removed from a precipitated fraction of polymer by redissolution and reprecipitation, suitably by slow addition to the precipitant. Better results follow from a counter-current method, whereby the solution is run slowly into a column up which precipitant flows. C—9.

Mono-layers: General Theory. ("General Theory of the Structure, Transformations and Mechanical Properties of Mono-layers.") M. Joly. *J. Colloid Sci.*, 1950, **5**, 49-70. The transformations of different orders in mono-layers are described and an attempted interpretation is based on the postulate that transformations of the different orders correspond to the discontinuous passage from one molecular form to another, the order of the transformation depending on the miscibility or non-miscibility of the successive molecular forms. The theory is applied to the direct calculation of the energy of activation of flow. The mean configuration of the molecules of the film in each of the stable molecular states is considered. The discontinuous passage from one molecular form to another is shown to be accompanied by liberation or blocking of a certain number of degrees of freedom in the molecule. A unique nomenclature for the different possible molecular states is deduced, and an equilibrium phase diagram valid for all monomolecular films is proposed. The conceptions can be extended to bulk systems. C—9.

Sodium Silicates and Silica Sols: Sorption by Cellulose Fibres. R. C. Merrill and R. W. Spencer. *Ind. Eng. Chem.*, 1950, **42**, 744-747. Sorption of both alkali and silica from sodium metasilicate, ammonium sulphate treated silica sol (N-Sol A) and a sulphuric acid-treated silica sol was measured at 25° C. for bleached sulphite, soda, kraft, and groundwood cellulose pulps. Similar data on sodium hydroxide are given for comparison. Both alkali and silica are sorbed by the cellulose fibres, but the amount of the former sorbed is usually much greater than that of the latter. The mechanisms of the sorption probably involve van der Waals forces, hydrogen bonding, and chemical reactions with metal oxide impurities. Practical applications of the data are discussed. C—9.

Cellulose Acetate/Chloroform/Alcohol System: Coacervation. C. H. Bamford and H. Tompa. *Trans. Faraday Soc.*, 1950, **46**, 310-316. The thermodynamic aspects of coacervation in non-electrolytes are explained in terms of the current statistical theories of polymer solutions. The system chloroform/alcohol/cellulose acetate is discussed in detail and the theoretical conclusions are compared with experimental results. Phase diagrams are reproduced. Coacervation is discussed briefly from a molecular point of view. C—9.

Macromolecules: Arrangement in Solids. R. Signer. *Bull. soc. chim. France*, 1949, 663-667 (through *Chem. Abstr.*, 1950, **44**, 2827[f]). The author discusses

methods of interpreting gel-permeability and streaming-birefringence determinations and electron micrographs, in terms of the molecular structure of micelles and fibres. C—**9.**

Oleate Coacervates: Action of Alkanes, Alkenes and Alkynes. ("Influence of Organic Compounds on Soap and Phosphatide Coacervates. XII.") H. L. Booij, J. C. Lycklama and C. J. Vogelsang. *Proc. Kon. Ned. Akad. Wet.*, 1950, **53**, 407-413. The influence of alkanes on oleate coacervates has been investigated by measuring the amount of potassium chloride solution required to produce coacervation. The action of alkanes is explained by assuming two different actions on the soap micelles: a condensing action (the concentration of KCl required for coacervation is decreased), and an opening action (KCl concentration must be increased). The different places in the soap micelle to which added substances can go are discussed; three are theoretically possible. From a consideration of these positions an explanation of condensing and opening action is obtainable. The effects of alkenes and alkynes are also considered. The introduction of a double bond has a profound influence giving rise to a condensing type of action. (For Part XI see *J. Textile Institute*, 1950, **41**, A382.) C—**9.**

Sodium Oleate: Critical Concentration for Micelle Formation by the Wien Effect. Marie Luise Exner. *Naturwissenschaften*, 1948, **35**, 344 (through *Chem. Abstr.*, 1950, **44**, 2824[b]). The Wien effect (increase in conductivity of electrolytes in an intensive field) is apparent at the critical concentration for micelle formation and can be used for the determination of this concentration. For a field strength of 100 kv. per cm. in sodium oleate a rapid rise in conductivity appears at $1 \cdot 25$ to $1 \cdot 50 \times 10^{-3}$ molar concentration. C—**9.**

Simple Ionic Exchange Systems: Equilibria. ("Ionic Exchange and Statistical Thermodynamics.") L. E. Davis. *J. Colloid Sci.*, 1950, **5**, 71-79. The conditions for ionic exchange equilibria are derived by an application of classical thermodynamics, only thermodynamically defined terms being used. The theory is first applied to a uni-univalent exchange. The resultant equation is of the simple mass-action type. Unsymmetrical exchanges are treated. C—**9.**

Linear Polymer Molecules: Solvation in Solution. ("Über einige Eigenschaften gelöster Gadenmoleküle, Statistische Theorie der Solvation in zweiter Näherung.") Arnold Münster. *Kolloid-Z.*, 1948, **110**, 200-208. The statistical theory of solvation of linear molecules in solution developed previously[1] is extended to the second approximation. The thermodynamical formulæ obtained are discussed for a series of special cases. The theory explains the remarkable experimental results for solutions of cellulose derivatives. Problems of the quantitative comparison between theory and experiment are discussed on the basis of the system rubber-benzene. ([1]*J. Textile Institute*, 1948, **39**, A508.) C—**9.**

Porous Materials: Moisture Permeability. E. C. Childs and N. Collis-George. *Proc. Royal Soc.*, 1950, **201A**, 392-405. By relating permeability to pore-size distribution the failure in certain circumstances of previous permeability theories is avoided. An expression of the permeability as the sum of a series of terms is obtained from a simple statistical theory based on the calculation of the probability of occurrence of sequences of pairs of pores of all the possible sizes, and of the contribution to the permeability made by each such pair. By stopping the summation at a selected upper limit of pore-size one may calculate the permeability at any chosen moisture content and plot it as a function of that content. To check the theory experimental determinations are recorded of the permeabilities of two different grades of sand and slate dust. Agreement seems good. It is shown how a combined use of the moisture characteristic and the permeability leads to an expression for the coefficient of diffusion of water in the material as a function of moisture content. C—**9.**

Glass Apparatus for Osmometry of Macromolecular Substances. P. Clément. *Bull. Soc. Chim. France*, 1949, 781-782 (through *Summary Current Lit. Res. Assoc. Brit. Rubber Mfrs.*, 1950, **28**, 293). An apparatus for determining high molecular weights and the polymolecularity of polymers is described. Two glass cells fitted with vertical semi-capillary tubes are separated by a vertical semi-permeable membrane and a grill in the side of one of them. This cell contains the solvent and the other the solution, so that osmotic pressure presses the membrane against the grill, thus eliminating the effect of ballooning. Each cell holds about 15 c.c. A metallic support permits the two cells to be tightly sealed together by means of a vice. C—**9.**

Cross-linked Polymethacrylic Acid: Swelling. J. W. Breitenbach and H. Karlinger. *Monatshefte für Chemie*, 1949, **80**, 312-313 (through *Chem. Abstr.*, 1950, **44**, 2333[f]). Methacrylic acid containing dibenzoyl peroxide and about 0·01 per cent. *p*-divinyl-benzene gives polymers that swell remarkably in water. Polymers may absorb up to 326 times their weight of water, giving jellies that are weak but stable in form. Jelly from a polymer swollen 81-fold by water is shrunk to 6-fold by 0·01 N hydrochloric acid, whereas in water containing 7 per cent. equivalent of potassium hydroxide it is swollen to 202-fold. The change in volume of these jellies may afford a useful model for the contraction processes of muscle tissue. Jellies absorb alkali from dilute aqueous solutions, and are soluble in strong alkali. The swelling is explained on the same basis as the increase in viscosity of polymethacrylic acid solutions on partial neutralisation. C—**9.**

High-molecular Solutions: Thermodynamics and Statistics. ("Thermodynamik und Statistik hochmolekularer Lösungen.") Arnold Münster. *Kolloid-Z.*, 1948, **110**, 58-71; **111**, 190-207. A review of recent investigations of the thermodynamics and statistics of high-molecular solutions, with particular reference to results obtained by non-German research workers. The subject is dealt with under the main headings: (i) Introduction; (ii) General principles; (iii) Theory of the athermic solution; (iv) Theory of the irregular solution; and (v) Experimental results. There are 137 references to the literature. C—**9.**

Cellulose Acetate: Viscosity; Effect of Salts. ("Salt Effect in Cellulose Acetate.") C. J. Malm, L. J. Tanghe and G. D. Smith. *Ind. Eng. Chem.*, 1950, **42**, 730-734. A procedure is described for the measurement of the increase in viscosity of cellulose acetate caused by the presence of certain salts ("salt effect"). Experimental data show that the influence of salts on viscosity depends on: the nature and amount of the salt; *p*H of the solution from which the salt is applied; solvent for the cellulose acetate in solution; degree of hydrolysis of cellulose acetate; and the amounts of carboxyl and combined sulphate in the cellulose acetate. Experimental results are shown in tables and graphs. C—**9.**

Falling-sphere Viscometer: Theory. Kashihara Eiji. *Proc. Faculty Eng., Keiogijuku Univ.*, 1948, **1**, No. 2, 9-12 (through *Chem. Abstr.*, 1950, **44**, 2308[b]). The motion of a falling body through viscous fluids is treated by solving equations of motion of particles, in which the drag force plays a vital rôle. The falling-sphere method is defined and it is shown that: the resistance is proportional to the velocity in the first case, which corresponds to Stokes's relation; and in the second the resistance involves the so-called inertia term and corresponds to Oseen's formula which yields somewhat better results than that of Stokes. Two experiments with a vertical cylinder containing a mixture of water and glycerol, and a steel sphere that was dropped by an electromagnet are described. For the measurement of viscosity by this method the necessary data are: the distance of fall from the position of rest and the time taken in falling. Oseen's expression should be used in place of Stokes's formula, for the former can farther extend the applicable region of the falling sphere method. Although the effect of the walls of the cylindrical container is reasonably large, it is ignored in this test. C—**9.**

Gum Tragacanth Solutions: Physico-chemical Properties. Nils Gralén and Marianne Kärrholm. *J. Colloid Sci.*, 1950, **5**, 21-36. The physico-chemical properties of solutions of gum tragacanth (undegraded and degraded) have been investigated, including sedimentation and diffusion constants, partial specific volume and intrinsic viscosity. Molecular weights and dimensions are calculated from the data. C—**9.**

Polyvinyl Acetates: Flow Processes. Walter Scheele. *Z. Naturforschung*, 1950, **4a**, 433-439 (through *Chem. Abstr.*, 1950, **44**, 2791[i], and *Physics Abstr.*, 1950, **53**, 280). The flow characteristics of a homologous series of polymerised polyvinyl acetates were measured with a Höppler consistometer. The relation between the flow rate (V) and shearing force (T) is $V=kT^n$, where k and n are constants that depend on the temperature. The work of deformation (W) can be calculated from k and n. There is a correlation between the slope of the temperature function of W and the degree of polymerisation. C—**9.**

Sodium Alginate (Solutions): Osmotic Pressure, Molecular Weight and Viscosity. F. G. Donnan and R. C. Rose. *Canadian J. Res.*, 1950, **28B**, 105-113. Osmotic pressure measurements have been made on sodium alginate solutions in

the presence of low concentrations of sodium chloride. The apparatus and experimental procedure are briefly described. Values of the mean molecular weight of sodium alginate have been obtained by carrying out osmotic pressure measurements at several different alginate concentrations (C) and extrapolating the curve connecting P/C and C (P = osmotic pressure) to $C = 0$. By substitution of the values of lim P/C thus obtained in a given expression the molecular weight has been calculated. Values from 48,000 to 186,000 were obtained. For different samples of sodium alginate the slope of the curve P/C against C was independent of molecular weight, and the limiting value of the osmotic pressure per unit of concentration was independent of the salt concentration. Intrinsic viscosities have also been obtained. The intrinsic viscosities of the different alginate samples were linearly related to the degree of polymerisation. C—**9.**

Structural Viscosity: Theory. S. Peter. *Kolloid-Z.*, 1949, **114**, 44-48 (through *Chem. Abstr.*, 1950, **44**, 2329[h]). The empirical equation of Williamson[1] for suspensions is derived by introducing a term allowing for the work of separating suspended particles. ([1] *J. Textile Institute*, 1929, **20**, A228.) C—**9.**

Consumptive Light Absorption: Determination; Influence of Tyndall Scattering. Erich Treiber and Erwin Schauenstein. *Z. Naturforschung*, 1949, **46**, 252-257 (through *Chem. Abstr.*, 1950, **44**, 2374[h]). An additive relation is found for the coefficients of Tyndall and consumptive (non-scattering) absorption of light in several systems of absorbing, non-scattering and scattering, non-absorbing particles. This relation holds for characteristic consumptive absorption and also for the band region of extrapolated Tyndall absorption. Scattering caused considerable distortion of the consumptive absorption bands. The wavelength exponent n of the equation $\epsilon' = K\nu'^n$, where ϵ' = the special extinction coefficient, and ν' = the wave number, were calculated graphically for the range in which there was no characteristic absorption. Extrapolation of Tyndall scattering was admissible and the additive relation applied in the range of characteristic absorption. The pure conservative (Tyndall) and consumptive absorptions were calculated for cellulose acetate in alcohol, viscose in caustic soda, starch paste, and proteins, including actomyosin, F- and G-actin, silk fibroin, and gelatin over the entire ultra-violet range. With increasing particle size ϵ' increased and n decreased. Since both ϵ' and n depend on the age of the solution, addition of electrolytes, *pH*, and other secondary influences, they cannot be considered characteristic constants of the materials, as in the case of consumptive absorption. C—**9.**

Food Colours: Spectrophotometric Analysis. ("Studies on Coal-Tar Colours," III-VII). III, Rachel N. Sclar, IV and V Mayer Dolinsky, VI K. A. Freeman and Charles Stein, VII K. A. Freeman and Charles Graichen. *J. Assoc. Offic. Agric. Chem.*, 1948, **31**, 598-602, 674-677; 1949, **32**, 130-135, 718-726, 726-731. Spectrophotometric data, obtained by means of a General Electric recording spectrophotometer equipped with automatic slit adjustment for an 8 mμ band, are presented for solutions of purified food colours Ext. D & C Orange No. 1, D & C Violet No. 2, Rhodamine B, and D & C Reds Nos. 14, 15, 16, 31 and 34. Beer's law is applicable to these colours. The data for absorption peak, extinction per mg./l., and extinction ratio are applied to the determination of pure dye in commercial samples of the colours; typical results are given. (For parts I and II, see *J. Textile Institute*, 1945, **36**, A431; 1947, **38**, A602.) C—**9.**

Proteins: Molecular Weight Determination by Longitudinal Scattering in Turbid Media. ("Molekulargewichtsbestimmung hochmolekularer Substanzen nach der Methode der longitudinalen Streuung in trüben Medien.") W. W. Lepeschkin. *Kolloid-Z.*, 1948, **110**, 89-93. A comparison of the Tyndall scattering of test material with that of known suspensions or colloidal solutions gives a method of determining the molecular weight of serum albumin, pseudoglobulin, and euglobulin that agrees with other methods. C—**9.**

Phase-microscopy Mounting Media. G. C. Crossman. *Stain Tech.*, 1949, **24**, 241-247 (through *Brit. Abstr.*, 1950, C, 110). Suggestions are made for a series of liquid and solid mounting media that range in refractive index from about 1·33 to 1·7 and provide maximum contrast for examining certain structures in paraffin sections of cells, whole mounts, sections of textile fibres, chemicals and minerals. C—**9.**

Fluid Flow Through Granular Material. H. E. Rose and A. M. A. Rizk. *Proc. Inst. Mech. Eng.*, 1949, **160**, 493-503, 504-511. Previous researches are

extended and equations are developed by means of which the resistance to fluid flow offered by a bed of spherical or non-spherical material may be computed with reasonable accuracy. The equations cover a range of porosity of the bed from 30 per cent. to 90 per cent. and virtually the whole of the technically important range of Reynolds number. A new curve for wall-effect, depending on Reynolds number, is also included. Discussion and communications on the matter of the paper are reported. C—**9.**

Linear High-molecular Compounds: Dielectric Measurement of Chain Mobility. ("Dielektrische Messung der Kettenbeweglichkeit von linearen hochmolekularen Substanzen.") F. Würstlin. *Kolloid-Z.*, 1948, **110**, 71-78. Dielectric constants of high-molecular substances were measured as a function of temperature at constant frequency. Data on polyvinyl alcohol are recorded for several frequencies. A congealing temperature measured dielectrically is distinguished from the mechanically measured congealing temperature. A difference between crystalline and amorphous polyesters is attributed to the motion of polar groups. Coiled chains are responsible for much of the difference observed. C—**9.**

Polyvinyl Chlorides: Cohesion and Polymerisation according to their Dielectric Loss. P. Girard, P. Abadie and R. Charbonnière. *C. r. Acad. Sci.*, 1949, **229**, 1316-1319 (through *Physics Abstr.*, 1950, **53**, 308). Results for four polyvinyl chlorides of different molecular weights are reported. For temperatures below 70° C. curves of dielectric loss differ from Debye's, representing the solid state; they do not show relaxation characteristics or viscosity. For temperatures of 80-100° C. curves of Debye type with viscosity arise, representing the liquid state. Between 70 and 80° C. the states coexist, their relative importance depends on the degree of polymerisation of the whole molecule. As molecular weight goes from 70,000 to 23,000 the relative importance of the liquid state grows and molecular cohesion decreases. C—**9.**

Polyvinyl Alcohol Films: Electronographic Study. G. I. Distler and Z. G. Pinsker. *Zhur. Fiz. Khim.*, 1949, **23**, 1281-1291 (through *Chem. Abstr.*, 1950, **44**, 2821[b]). Unstretched polyvinyl alcohol films display four spacings—4·54, 2·23, 1·70 and 1·26 Å. Comparison with models having various degrees of orientation shows that the films consist of orientated patches differing in dimension and shape. These patches are nuclei for extensive structures formed on stretching. The electron beam used had the wavelength 0·06 Å. The literature data on the spacings of other unstretched films are reviewed and an electronograph of a nylon film is recorded. C—**9.**

Loose Materials: Particle Size Distribution; Graphical Representation. H. Gessner. *Schweiz. Arch. angew. Wiss. Tech.*, 1949, **13**, 265-268 (through *Physics Abstr.*, 1950, **53**, 257). Sieve analysis can be used to determine the quantity of material within various size groups down to about 0·08 mm. Sedimentation is employed for finer particles. The results may be plotted as quantity of material in the sample exceeding the sizes plotted along the abscissa; the sieve and sedimentation results are frequently plotted separately, and an additional curve is given showing the total result. When the slope of this curve is plotted against the particle size, a type of frequency curve is obtained which indicates the frequency with which particles of each size occur in the sample. Details are given of the graphical construction to obtain this type of curve, and the work is illustrated by examples. C—**9.**

Particulate Matter: Harmonic Mean Particle Size; Relation to Specific Surface. G. Herdan. *Nature*, 1950, **165**, 858-859. It is sometimes assumed that the reciprocal of the harmonic mean particle size ($1/M_h$) of a powder, and the reciprocal of average particle size ($1/M$) in the formula for the specific surface, are more or less identical. This is not so unless all the particles are of exactly the same size and form a strictly mono-disperse powder. A proof is given that, in general, the two reciprocals are not identical, the difference being systematic and dependent upon the variability of particle size. This result is important in the application of the Kozeny equation for the permeability constant of particulate matter. C—**9.**

Polyamides and Polyurethanes: Spherulitic Structure. W. Brenschede. *Kolloid-Z.*, 1949, **114**, 35-44 (through *Chem. Abstr.*, 1950, **44**, 2791[g]). Spherulites were investigated in several polyamides and polyurethanes. The structural element of the spherulite has one optical axis directed radially. Its birefringence

was determined at temperatures up to the melting point. Positive birefringence (which decreases towards zero, and may even change sign, considerably below the melting range) is due to submicroscopic radial cracks. Negative birefringence (which persists until the spherulite melts) is due to weakly preferred orientation of the molecular chains in concentric layers. The formation of such an orientated structure, as crystallisation proceeds outward from the centre, is likened to the tangential orientation occurring when a film is produced by evaporation of solvent. C—**9.**

Metals: Plastic Flow; Application of Relaxation Methods. J. A. Jacobs. *Phil. Mag.*, 1950, [vii], **41**, 458-467. A general theory of plastic strain, discussed in part I,[1] is applied to two problems: (i) a sharp-ended bar under specified edge tractions, and (ii) the uniform compression of a block between two smooth rigid plates, which do not overlap it. ([1]*J. Textile Institute*, 1950, **41**, A377.) C—**9.**

Colloidal Systems: Diffuse Small-angle Scattering of X-Rays. Günther Porod. *Z. Naturforschung*, 1949, **4a**, 401-414 (through *Chem. Abstr.*, 1950, **44**, 2368[e]), and *Phys. Abstr.*, 1950, **53**, 314). The derivation of the theoretical treatment of small-angle scattering of X-rays is briefly discussed for dilute systems, concentrated systems, and extraneous small-angle scattering. For dilute systems the approximation methods of A. Guinier and O. Kratky are considered and the three methods of the author[1] for the exact calculation of the scattering curves for differently shaped particles are given. Small variations in particle shape affect the nature of the scattering curves only slightly. Spherical, needle-like, and plate-like particles can be differentiated by the nature of the decrease of intensity with angular increase. The effect of periodic structures and the difference between extended and coiled thread-like particles are discussed. For concentrated systems the occurrence of special effects is described and differentiation between orientated and unorientated systems is introduced. Typical differences observed in comparison with dilute systems are shown by two examples. Extraneous small-angle scattering is explained, and methods of avoiding it are discussed. ([1]*J. Textile Institute*, 1950, **41**, A90.) C—**9.**

High Polymers: X-Ray Diffraction and Fine Structure. Rolf Hosemann. *Z. Electrochemie*, 1949, **53**, 331-334 (through *Chem. Abstr.*, 1950, **44**, 2368[e]). To treat the problem of the diffraction of X-rays from high polymers a model based on the superposition of two independent distributions of scattering matter is assumed. The intensity function is derived for a one-dimensional array of randomly disordered lattice points, modified by a second distribution of scattering material interspersed between these points. Approximate formulæ for the intensity and width of the diffraction maxima are given; the diffraction at small angles, the liquid-like scattering, and strong background are discussed. C—**9.**

Lignins: X-Ray Structure. ("Röntgenstrukturuntersuchungen an Ligninen.") H. Zahn and W. Lautsch. *Kolloid-Z.*, 1948, **110**, 82-89. X-Ray data for beech lignin are less definite than those of pine lignin. Data on several phenolic substances serving as model materials are tabulated. The results do not lead to a decisive picture of the structure of lignins. Lignin has a mesophase with a chain structure in beech and a layer structure in pine. C—**9.**

Experimental Design. M. H. Quenouille. *Research*, 1950, **3**, 213-217. The design of experiments on a statistical basis (Latin square, *etc.*) is described. Both short- and long-term experiments are dealt with and examples are given of the planning of experiments on the lines discussed. C—**9.**

Cotton: Inheritance of Fineness of Lint. P. Iliev. *Rev. Inst. Rech. Agron. Bulg.*, 1942, **12**, 51-58 (through *Plant Breeding Abstr.*, 1949, **19**, 838). Hybrids of *G. hirsutum* have been developed for a study of the inheritance of fineness. Cross-section measurements of the lints showed that fineness was inherited as a dominant character in the F_1. C—**9.**

Cotton Somatic Tissue: Chromosome Number; Spontaneous Reduction. M. S. Brown. *Amer. J. Botany*, 1947, **34**, 384-388 (through *Plant Breeding Abstr.*, 1949, **19**, 837). Among the F_1 progeny from a cross of a garden variety of okra, *Hibiscus esculentus*, on to the *Gossypium hirsutum* variety Coker 100 was a plant designated Z118. A morphological description is given, and cytological observations are described and discussed. Approximately 100 chromosomes, which is nearly twice the somatic number of *G. hirsutum* $2n=52$, were found at meiosis. It is considered improbable that the plant represents a hybrid between cotton and

okra. Nor is it a balanced polyploid of *G. hirsutum*. The unbalanced chromosome complement would account for the abnormal growth and sterility. After several seasons, the distal part of a year-old graft of Z118 became more nearly normal in morphology, though remaining sterile; it was designated X118-1. Cytological analysis showed that it had 51, *i.e.* $2n-1$ chromosomes. Further details are given of cytological observations. The significance of the change in morphology and chromosome number is discussed. The conclusion is drawn that the somatic reduction in chromosome number to a number approximately that of the normal complement represents a mechanism by which unbalanced plant types may eliminate incompatible chromosomes and thus establish more viable forms. C—**9**.

Gossypium Hybrid Polyploids and Aneuploids: Genetics. M. S. Brown. *Proc. 8th Int. Congr. Genet. Stockholm, 1948; Hereditas* (Suppl.), 1949, 543-545 (through *Plant Breeding Abstr.*, 1949, **19**, 835). Work carried out at the Texas Agricultural Experiment Station is described on polyploids and aneuploids derived from *Gossypium* interspecific hybrids. Hexaploids have been obtained by combining *G. hirsutum* and *G. barbadense* with *G. arboreum*, *G. herbaceum*, *G. anomalum*, *G. Sturtii*, *G. Thurberi*, *G. Harknessii*, *G. armourianum*, *G. Reimondii*, and *G. Stocksii*. Back-crossing hexaploids with *G. hirsutum* has given rise to aneuploid forms with one or more chromosomes from the diploid species. Examination of almost 200 trisomic types has disclosed that one extra chromosome may affect the shape, colour and texture of leaf and bracteole, the size and colour of floral parts, size and shape of boll, and colour of fibre and seed coat. Selfing and intercrossing of trisomics have given rise to tetrasomics and double trisomics. Monosomic plants have occurred spontaneously as a result of non-disjunction in trisomic lines, and following irradiation and intergeneric pollination. No nullisomics have been observed. Fertile amphidiploids of hybrids of diploid species have been induced. C—**9**.

New World Amphidiploid Cottons: Genom Analysis. S. G. Stephens. *J. Heredity*, 1949, **40**, 102-104 (through *Plant Breeding Abstr.*, 1949, **19**, 836). A proposed technique for allocating genetic loci in New World cottons to their correct subgenoms *A* and *D* is based upon the suitable choice of multiple dominant and multiple recessive "marker" stocks for parents in the production of synthetic amphidiploids of the type *AD* between American and Asiatic diploids, and for the New World parents (*AD* genom) used in the subsequent crossing and back-crossing of these amphidiploids. A hypothetical case is considered in detail. C—**9**

Upland Cotton: Inheritance and Economic Value of Indicating Characters. T. S. Chang. *J. Agric. Assoc. China*, 1944, No. 178, 37-49 (through *Plant Breeding Abstr.*, 1949, **19**, 835). A selection of Delfos 531 with the characters red plant, okra leaf, non-virescence and naked seed and the genotype $R_2^{MO}R_2^{MO}$ L^OL^O *VV FnFn* was crossed with another cotton possessing the characters of sun red plant, non-okra leaf, virescence and fuzzy seeds and the genotype $R_2^{AO}R_2^{AO}$ *ll vv fnfn*. The investigations were carried out with a view to finding a suitable marker character for use in the maintenance of varietal purity. The lint percentage of naked seeds is low so that this character was discarded before testing the progeny. Yield was significantly affected by red plant, okra leaf and virescence; none of these characters is therefore suitable for the purpose under consideration. In combination, however, it was found that L^O and *V*, the genes for okra leaf and non-virescence, respectively, exerted scarcely any influence on yield. C—**9**.

Soy Bean β-Amylase: Action on Amyloheptaose. ("Studies on the Schardinger Dextrins. IV.") Dexter French, M. L. Levine, J. H. Pazur and Ethelda Norburg. *J. Amer. Chem. Soc.*, 1950, **72**, 1746-1748. Soy bean β-amylase hydrolyses amyloheptaose or amyloheptanoate to give two moles of maltose and one mole of amylotriose or amylotrionate respectively. The preparation and analytical values for amorphous amylotriose are reported. Amylotriose and amylotrionate are stable to the action of β-amylase. β-Amylase produces maltose from amyloheptaose and starch at essentially the same rate. Amylopentaose does not accumulate in significant amount during the enzyme digests. (See also *J. Textile Institute*, 1949, **40**, A266.) C—**9**.

Sodium Hypochlorite and Hydrogen Peroxide Solutions: Gasometric Determination. J. Malagelada. *Farm. nueva*, 1948, **13**, 580-581 (through *Chem. Abstr.*, 1950, **44**, 3842[i]). Either sodium hypochlorite or hydrogen peroxide can

be determined gasometrically according to the equation

$$NaOCl + H_2O_2 = NaCl + H_2O + O_2$$

by using the other compound in slight excess. A conversion table for the direct reading of NaOCl content is given in the original. **C—9.**

Cellulose Uronic Acids: Micro-analysis. A. S. Salova. *Zhur. Anal. Khim.*, 1949, **4**, 354-358 (through *Chem. Abstr.*, 1950, **44**, 4249[e]). A sample yielding not more than 0·5 mg. of carbon dioxide is digested with 50 ml. of 12 per cent. hydrochloric acid. The CO_2 is absorbed in 0·02 N. barium hydroxide and the excess is titrated with 0·02 N HCl. The CO_2 yield is recalculated in terms of uronic acid. **C—9.**

α-Chlorinated Acids: Paper Chromatography; Application in Determining Dipeptide Structure. Marcel Renard. *Bull. Soc. Chim. Belges*, 1949, **58**, 301-309 (through *Chem. Abstr.*, 1950, **44**, 3409[h]). Paper chromatography of chloroacetic acid and α-chloropropionic acid was studied. The mixture of the two acids was displaced by dichloroethylene in a moist atmosphere and the acid zone detected with methyl orange. *R* values for each of the acids and for mixtures are given. The presence of either of the acids in an unknown mixture is detected by addition of a known amount of the suspected acid. Appearance of a single acid zone indicates identity. The application of this method for determining the structure of dipeptides is shown with alanyl-glycine. **C—9.**

Polyvinyl Chlorides: Chlorine Content Determination by Pyrogenation. André Tribot and Raymond Simon. *Chim. Anal.*, 1950, **32**, 31-32 (through *Chem. Abstr.*, 1950, **44**, 3402[b]). Polyvinyl chloride compounds yield hydrogen chlorine when heated above 100° C. If the heating is carried to dull redness, the evolution of HCl is practically complete. In a suitable apparatus consisting of a drawn out bulb with a very long and narrow neck bent downwards at an angle of about 60° and dipping into 200 ml. of water, the HCl can be absorbed and titrated. **C—9.**

Sulphur: Determination of Traces in Organic Compounds. H. N. Wilson and H. T. Straw. *J. Soc. Chem. Ind.*, 1950, **69**, 79-82. In a method for the determination of small amounts of sulphur in organic compounds the sample is run through a vertical tube heated to 830° C. and packed with sand and quartz containing a vanadium pentoxide catalyst. A rapid stream of air is passed through the tube. Any sulphur present is oxidised to sulphur dioxide which is trapped in a train of bottles containing hydrogen peroxide. The sulphur is estimated either by precipitation as barium sulphate or (if sufficient sulphur is present and no halogen) by titration of the sulphuric acid with caustic soda solution. **C—9.**

Cellulose: Ethylation in Vacuum in the Presence of Wetting Agents. ("Méthode d'obtention d'éthyl-cellulose à partir de sulfate d'éthyle en travaillant sous vide en présence de mouillants.") J. Chédin and A. Tribot. *Mém. Services Chim. Etat*, 1948, **34**, 195-201. The action of different wetting agents on the ethylation process has been studied by the method of a previous investigation of the ethylation of alkali-cellulose by ethyl sulphate under vacuum.[1] The results show an increase in the rate of ethylation, but the quantities of caustic soda and of ethyl sulphate consumed are not affected by the addition of wetting agent. ([1] *J. Textile Institute*, 1949, **40**, A265.) **C—9.**

Cellulose: Heats of Esterification by Nitric Acid. ("Chaleurs d'estérification de la cellulose par l'acide nitrique.") Édouard Calvet. *Mém. Services Chim. Etat*, 1948, **34**, 179-193. The esterification of cellulose (cotton linters) by sulphuric acid-nitric acid and acetic acid-nitric acid mixtures has been carried out in a micro-calorimeter in order to determine directly the heat of esterification of cellulose by nitric acid and to study the kinetics of the esterification reaction. The agreement between the values found for the heats of esterification leads to the conclusion that the structure of the nitrocelluloses obtained by the different nitrating mixtures is the same and that the average heat of esterification is 2050 ± 150 cal. per OH group esterified, irrespective of the composition of the bath. This quantity is small as compared with the total heat liberated during the esterification reaction. Curves of the heat of esterification per hour plotted as a function of time show that the thermal effect in the acetic acid-nitric acid baths disappears after about two hours whereas it persists for about 10 hours in the sulphuric acid-nitric acid baths. **C—9.**

Cellulose: Nitrating Power of Nitric Acid Mixtures. ("État moléculaire de l'acide nitrique dans différents mélanges et pouvoir nitrant sur la cellulose. Équilibres de nitration.") J. Chédin and A. Tribot. *Mém. Services Chim. État.* 1948, **34**, 277-287. A study of the nitration of cellulose by (i) binary mixtures of nitric acid and water, (ii) pure nitric acid, and (iii) mixtures of nitric acid and metallic salts with or without water is based on previous researches on nitric acid and its mixtures. The reversible equation: $NO_3H + ROH \rightleftarrows RONO_2 + H_2O$ well expresses the results obtained provided that the real concentrations of free HNO_3 and H_2O are introduced. The relationship between nitrating power (number of OH groups nitrated per C_6) and the concentration of the nitrating mixtures is discussed with the help of equilibrium equations whose constants have been determined approximately. C—**9.**

Cellulose: Reducing End-group Determination. Alexander Meller. *TAPPI*, 1950, **33**, 11-15 (through *Chem. Abstr.*, 1950, **44**, 4243[i]). The method of Hiller and Pacsu[1] was used to establish the end-group content of a sample of commercial surgical cotton wool and two hydrocelluloses prepared therefrom. Carboxyl groups were determined according to the method of Wilson. In determining the end groups the concentration of potassium permanganate and sulphuric acid was varied. The experiments were continued over 16 hours and at no time did the oxygen consumption cease, in contrast to the claims of Hiller and Pacsu. The hydrocelluloses, having 99·7 per cent. yield, showed lower rate of oxygen consumption than the cotton wool. The author uses his data as a basis for criticism of the hemi-acetal theory of cellulose structure of Pacsu.[2] ([1]*J. Textile Institute*, 1946, **37**, A487; [2]1948, **39**, A161.) C—**9.**

Hydroxyethylcellulose *p*-Toluenesulphonic Esters: Preparation and Properties. G. Champetier and P. Fournier. *Bull. Soc. Chim. France*, 1949, 695-700 (through *Chem. Abstr.*, 1950, **44**, 4245[a]). Cellulose treated with caustic soda and ethylene oxide gives compounds of the type $RO\cdot CH_2\cdot CH_2\cdot OH$ (R = cellulose residue). Longer reaction time causes introduction of more hydroxyethyl groups, but degradation also occurs and very soluble products are formed. $RO\cdot CH_2\cdot CH_2\cdot OH$ is almost completely esterified by treatment with *p*-toluenesulphonyl chloride in pyridine for 3 hours at room temperature. Under these conditions, native cellulose reacts very slightly. Heating the ester with ammonium hydroxide at 100° C. in an autoclave results in very slight introduction of amino groups. The chief product is insoluble in both organic solvents and aqueous alkali. The reaction appears to be saponification of the $CH_2\cdot CH_2\cdot OH$ group with formation of an anhydrocellulose. This is confirmed by acetylation of the saponified product to give only a mono-acetate. $RO\cdot CH_2\cdot CH_2OH$ and sodium iodide gave iodoethylcellulose which with ammonia in an autoclave at 100° C. gave aminoethylcellulose. By similar double decomposition with sodium sulphide and sodium thiocyanate, $RO\cdot CH_2\cdot CH_2\cdot OH$ gives $RO\cdot CH_2\cdot CH_2\cdot SNa$ and $RO\cdot CH_2\cdot CH_2\cdot S\cdot CN$. All these compounds are insoluble in organic solvents. C—**9.**

Lignin and Cellulose: Separation. Raphael Katzer, Joseph Pearlstein, R. E. Muller and D. F. Othmer. *TAPPI*, 1950, **33**, 67-72 (through *Chem. Abstr.*, 1950, **44**, 4248[a]). Sawdust or wood shavings were treated with chlorine in methyl alcohol at 66° C. Crude cellulose was separated by filtration and methoxylignin chloride was separated from solution. Methyl alcohol chlorination was preformed on various types of wood shavings. A detailed study of the effect of extractives was made on redwood. Detailed reaction rate studies were made on sugar maple, white oak, redwood and on jackpine Asplund fibre. Larger-scale studies indicated the advantages of increased pressure and temperature. C—**9.**

Nitrocellulose: Partition Fractionation. ("Partition Systems for the Fractionation of Nitrocellulose with Respect to Molecular Weight.") M. C. Brooks and R. M. Badger. *J. Amer. Chem. Soc.*, 1950, **72**, 1705-1709. Several two-phase systems in which cellulose triacetate gel is brought to equilibrium with mixtures of methyl acetate and co-solvent have been investigated with respect to the distribution of nitrocellulose between the phases. The distribution constants of nitrocellulose were found to be dependent both on the molecular weight and on the degree of nitration but independent of nitrocellulose concentration in the range 0-10 mg. of nitrocellulose per g. of cellulose triacetate. The rate at which nitrocellulose establishes equilibrium between gel and supernatant phases is apparently limited by diffusion within the gel particles; the rate was increased

by reducing the size of the gel particles. A system in which methyl acetate and water are used as co-solvents shows promise for application in a partition chromatographic fractionation of nitrocellulose. C—**9**.

Nitrocellulose: Polymer Distribution; Measurement by Turbidimetric Titration. André Oth. *Bull. Soc. Chim. Belges*, 1949, **58**, 285-300 (through *Chem. Abstr.*, 1950, **44**, 3336[a]). The method of Morey and Tamblyn[1] was used to determine the molecular weight distribution in a heterogeneous sample of nitrocellulose by suitable operation on a curve relating the mass of polymer precipitated to the amount of precipitant added to the solution. The method was calibrated by use of polymer fractions of known molecular weight dissolved in solutions of known composition. Reproducible results were obtained experimentally when polymer concentrations of 0·1 per cent. or less were used, and the temperature, speed of agitation, and rate of addition of the precipitant were kept constant. Use of initial concentrations of nitrocellulose in acetone of 0·1 per cent., addition of precipitant (90 methanol: 10 water) at a rate of 1 cc./min. at 25° C., and measuring the increase in turbidity as a function of precipitant added provided the necessary curve for analysis. The molecular weight distribution so obtained agreed well with that obtained by classical gravimetric methods. The method can be applied to other polymer systems. ([1] *J. Textile Institute*, 1945, **36**, A480.) C—**9**.

Amylopectin: Purification by Adsorption on Stearic Acid. ("Purification de l'amylopectine. Recherches sur l'amidon 46.) K. H. Meyer and G. C. Gibbons. *Helv. Chim. Acta*, 1950, **33**, 210-213. A method is described for removing amylose from crude amylopectin by adsorption on solid stearic acid. Potentiometric titration with iodine showed that samples of amylopectin purified in this way were free from traces of amylose. Titration curves are given. C—**9**.

Amylopectin: Fractionation. ("Fractionnement de l'amylopectine.") K. H. Meyer and G. C. Gibbons. *Helv. Chim. Acta*, 1950, **33**, 213-217. Amylopectin from potato starch has been fractionally precipitated by electrodialysis in the presence of iodine. Measurements of degree of the polymerisation, light absorption by the iodine complexes, percentage of end-groups, *etc.*, are reported for the seven fractions thus obtained and show that the fractions are chemically identical or at least very similar. C—**9**.

Low-molecular Amylose: Behaviour with Complexing Agents. William Dvonch, H. J. Yearian and R. L. Whistler. *J. Amer. Chem. Soc.*, 1950, **72**, 1748-1750. An investigation has been made of the behaviour of low-molecular amylose with *n*-butyl alcohol, 2-nitropropane, *n*-amyl acetate, *n*-amyl methyl ketone, and nitrobenzene. Results show that when amylose is acid-hydrolysed to a degree of polymerisation of about 20-40, it can no longer form insoluble complexes with nitrobenzene, *n*-amyl acetate, and *n*-amyl methyl ketone. However, it is still capable of forming an insoluble complex with *n*-butyl alcohol and to some extent with 2-nitropropane. The e.m.f. of iodine complex formation varies inversely with the D.P. of amylose and with a D.P. of less than about 50 it is not possible to separate surface adsorption from complex formation. C—**9**.

Potato Starch: Action of Hydrochloric Acid. J. Hofstee. *Proefstat. Aardappelverwerk, Kort Ber.*, 1950, No. 24, 3 pp. (through *Chem. Abstr.*, 1950, **44**, 3730[b]). Potato starch was shaken for 24 hours with 0·001-0·1 N hydrochloric acid. The *pH* of the suspension ranged from 6·4 to 1·1. The gels obtained by boiling the treated starch (after washing until chlorine was absent) were tested for rigidity. The degradation was established by measuring the turbidity of a 1 per cent. solution immediately after preparation and after 16 hours. The gel strength plotted against the *pH* of the initial suspension shows a maximum. At *pH* 1 the starch becomes soluble. C—**9**.

Aminocaproic Acid: Preparation and Properties. Kohei Hoshino and Sukehane Funami. *J. Soc. Org. Synthetic Chem.* (Japan), 1949, **7**, 3-4 (through *Chem. Abstr.*, 1950, **44**, 3895[e]). From $[NH\text{–}(CH_2)_5CO]_m$ (Amilan) fibre waste was obtained 5-amino-*n*-caproic acid, melting point 202° C., by heating in an autoclave with dilute sulphuric acid. This aminocaproic acid promotes the growth of yeast in an inorganic medium as much as when organic nutrients are added and accelerates germination of seeds and rooting of seedlings after immersion in a 100,000 dilution for 1-6 hours. C—**9**.

Casein: Constituents. ("Recherches sur la caséine. V. Sur les constituents de la caséine.") Emile Cherbuliez and Pierre Baudet. *Helv. Chim. Acta*, 1950, **33**, 398-404. Casein from cow's milk has been separated into fractions α, β, γ and δ. The α and β fractions have been described previously by Warner.[1] Details are given of the fractionation scheme, which was based on that of Warner, and of the properties of the fractions. The α-fraction has been divided into α_1 and α_2 by precipitation at 40° C. in the presence of ammonium sulphate. The calcium salts of β and γ caseins, insoluble between *pH* 5 and 6 respectively, and *pH* 7·5, are kept in solution by the calcium salt of α casein, which acts as a protective colloid. There is evidence for an interaction between α and β caseins. ([1] *J. Textile Institute*, 1945, **36**, A138.) C—**9**.

Gelatin: Structure. ("Contribution à l'étude de la structure des gélatines.") J. Pouradier and (Miss) A. M. Venet. *J. Chimie Phys.*, 1950, **47**, 11-20. The comparison of results of measurements carried out on aqueous gelatin solutions below the fusion temperature of the gel seems to prove that in these conditions, at least in dilute solution, gelatin is dispersed molecularly. It is also shown that the osmometric method of determining molecular mass is applicable to gelatins and that the molecular masses thus determined are characteristics of the gelatins studied and do not depend upon the solvent. A study of the variation of viscosity of a dilute gelatin solution with concentration permits the definition of an intrinsic viscosity of gelatin, characteristic of the system gelatin/solvent, which gives an indication of the shape of the gelatin molecule in solution. Finally, a method of fractionating gelatin is described, by means of which relatively homogeneous fractions with molecular masses ranging from 15,000 to 250,000 have been extracted from a commercial gelatin. There are 46 references to the literature. C—**9**.

High Polymers: Chemical Resistance. Massimo Rocca. *Materie plastiche*, 1949, **15**, 119-125 (through *Chem. Abstr.*, 1950, **44**, 3871[g]). The average chemical resistance of an organic compound is expressed as the sum of the internal bond energies divided by the product of the total number of terminal atoms and their valencies. By dividing the average chemical resistance of a compound by the average chemical resistance of the corresponding hydrocarbon, the relative medium chemical resistance is obtained. The chemical stability of high polymers is expressed by the average chemical resistance and the relative medium chemical resistance of its unit cells. Data are given for a number of polymers including polyethylene, polyvinyl chloride, polyvinyl alcohol, polyvinyl acetate, and polymethyl methacrylate. Several hypothetical unit cells are also given. The concept of the average chemical resistance is also applied to explain the comparative chemical stability of certain compounds, the effect of cross linking, and the polymerisation mechanism. C—**9**.

High Polymers: Degradation. H. H. G. Jellinek. *J. Polymer Sci.*, 1950, **5**, 264-265. An expression is derived for the decrease of the number-average molecular chain length with time for a homogeneous polymer sample of any finite molecular weight. The expression is the same as that obtained by Casassa[1] for a polymer of (infinitely) high molecular weight. ([1] *J. Textile Institute*, 1950, **41**, A30.) C—**9**.

Proteins: Heat Denaturation. ("Neue Methoden bei der Untersuchung der Proteine und der Wärmewirkung auf dieselben.") W. W. Lepeschkin. *Kolloid-Z.*, 1948, **111**, 107-110. Recent methods for the investigation of proteins have shown that the molecular weight is not the same at different temperatures since protein molecules can polymerise or disintegrate reversibly under the action of heat. The heat denaturation of proteins consists of two processes: a hydrolysis, accompanied by a modification of the molecular structure, and a further denaturation. Alkaline hydrolysis yields products with a different structure than does acid hydrolysis. C—**9**.

Silicones: Properties and Applications. O. Eisenhut. *Textilberichte*, 1949, **30**, 462-467. The fundamental chemistry of silicon products is discussed and explained. Laboratory and technical methods of preparation are reviewed, and properties and applications of some silicone compounds are considered. C—**9**.

"Birlec Lectrodryers": Application. ("Moisture Control With Solid Adsorbents.") J. C. Mantell. *Chem. Products*, 1950, **13**, 271-273. The effects of changes of temperature and pressure on the relative humidity of an atmos-

phere and on the amount of moisture on surfaces exposed to that atmosphere are briefly described. The detrimental effects of surface moisture and methods of removing it are discussed. Particular mention is made of the use of solid adsorbents such as silica gel and activated alumina. Illustrations and flow diagrams are given of the Birlec "Lectrodryers" types B and CH. Practical applications are indicated. C—**9.**

Surface-active Agents: New Methods of Study. ("Application de nouvelles méthodes de mesure à l'étude de composés tensioactifs.") Madeleine Raison and Raphaël Matalon. *Mém. Services Chim. État*, 1948, **34**, 353-371. The activities of a number of German surface-active agents at liquid/air and liquid/solid interfaces have been studied. Surface tension measurements have been carried out; the wettability is estimated by the method of Boutaric and Baujard (1936), and is characterised by the ratio of the spreading surface to the volume of the drop, $S/V = m$. The frothing power is determined by a laminometric method and by measuring the volume of froth produced on agitation. The results are presented in numerous graphs and tables and are discussed. C—**9.**

Wetting Agents: Direct Measurement of Adhesive Force. ("Mesure directe de la tension d'adhésion. Modes d'action des mouillants.") Lina P. Guastalla and Jean Guastalla. *Mém. Services Chim. État*, 1948, **34**, 373-379. A direct method of measuring adhesive tension is derived from the measurement of surface tensions by means of a thin brass foil coated with a film of paraffin wax. Preliminary results indicate three possible modes of action of wetting agents: (i) by simple lowering of surface tension; (ii) by removing the film on the solid surface; and (iii) by direct fixation of molecules of the wetting agent on the solid surface in contact with the solution. C—**9.**

Colloid Chemistry: French Investigations, 1940-1947. ("Sammelbericht über französische Arbeiten auf dem Gebiete der Kolloide zwischen 1940 und 1947.") Maurice Joly. *Kolloid-Z.*, 1948, **111**, 207-216. A review is presented of investigations on colloids published by French authors between 1940 and 1947 under the following headings: (i) Methods and technique of investigation; (ii) Surface phenomena; (iii) Disperse systems; (iv) Wetting and detergency; (v) Colloidal electrolytes; (vi) Sols and suspensions; (vii) Gels; (viii) Equilibria and phase changes in colloidal systems; (ix) Macromolecules; (x) Proteins; (xi) Molecular complexes and colloidal systems; and (xii) Miscellaneous. An alphabetical list of 229 literature references is appended. C—**9.**

Starch: Pasting Mechanism. Jirô Nikuni and Hidetsugu Fuwa. *J. Agric. Chem. Soc. Japan*, 1949, **23**, 60-62 (through *Chem. Abstr.*, 1950, **44**, 3730[d]). When corn starch or potato starch was heated at $61 \pm 0{\cdot}5°$ C. with water, the gelation was not complete even after 5 hours, since the starch paste showed β-starch structure on X-ray study. When potato starch was kneaded with water and then boiling water was poured on the paste, there was obtained a semi-transparent, thick gel, from which a sample was dehydrated. It showed α-starch structure on X-ray study. Here gelation and conversion to α-starch were completed simultaneously. Granules must be boiled with water at 100° C. for more than 20 minutes to become edible (α-starch). Rice powder was readily converted to α-starch by a short-time boiling with water. On heating with sufficient water, water molecules penetrate into intramicellar space as hydrate water when their kinetic energy becomes larger than the lattice energy of the micelle. The complete paste formation should always be accompanied by α-starch structure and no micellar structure be recognisable by X-ray study. On cooling this paste some chains would assemble together to micellar structure and β-starch structure appear. C—**9.**

Dilute Athermic Solutions: General Equation of Dilution Entropy. ("Über eine Ableitung der allgemeinen Gleichung für die Verdünnungsentropie der verdünnten athermischen Lösung.") Arnold Münster. *Kolloid-Z.*, 1949, **112**, 13-16. A general formula is derived for the calculation of the combination factor of the dilute athermic solution. The equation obtained for the dilution entropy is valid for molecules of any size, shape, and mobility. It agrees with the formula previously derived according to the method of true molecules. Application to the problems of spherical molecules and of rigid, stretched thread molecules gives the same results as the special derivations by other authors. C—**9.**

Macromolecules: Solubility and Cohesive Energy Density. ("La solubilité des macromolécules et la densité d'énergie cohésive.") J. Duclaux. *J. Chimie physique*, 1950, **47**, 2-4. A critical discussion of the concept of cohesive energy density, introduced by Hildebrand. With nitrocellulose and cellulose acetate as examples it is shown that knowledge of the energy density does not permit the prediction of solubility in an organic liquid any more than do the older concepts of dipole moment or the Walker coefficient ($=T/\sqrt{M}$, where T is the normal boiling temperature and M the molecular weight). C—**9**.

Flax Seed: Diffusion of Moisture through —. D. E. J. Samuels and B. H. Tait. *Brit. J. Applied Phys.*, 1950, **1**, 125-131. The variation of moisture content through a bulk of flax seed has been measured over a period of one year. Initially each bulk sample of seed had a uniform moisture content throughout its volume. The surface was exposed to an atmosphere of 75 per cent. R.H. and the moisture content at various levels throughout the sample was determined gravimetrically at intervals. The controlling factor in the movement of water through the seed appears to be diffusion of water vapour through the interstitial air space. An empirical relationship was found to apply for a limited range of conditions. C—**9**.

Airborne Droplets: Measurement by the Magnesium Oxide Method. K. R. May. *J. Sci. Instruments*, 1950, **27**, 128-130. A complete calibration has been made of the method of detecting and measuring airborne droplets in which the permanent impressions made when they strike a layer of magnesium oxide smoked on a glass slide are measured microscopically. The calibration was made against an absolute method of droplet measurement and against the so-called "focal-length" method. Droplets of any desired size were generated by a uniform spray apparatus. A size range of 200 to 10 μ and a wide range of liquids and impact velocities were investigated and it was found that the ratio of true drop size to impression size is constant at 0·86 for droplets greater than 20 μ of any liquid. The method fails below 10 μ. C—**9**.

High Polymers: Rapid Molecular Weight Determination. ("Contribution à la thermodynamique des solutions de hauts polymères." VI.) Juliette G. Gavoret. *Mém. Services Chim. Etat*, 1948, **34**, 117-120. A rapid and simple method for determining the average molecular weight of high polymers is based on the measurement of the precipitation threshold or appearance of turbidity when a non-solvent is added to a solution of any, but known, concentration of the polymer. The precipitation threshold depends on a certain function of the weight-average molecular weight. Experimental results for GR-S rubber are presented. The effect of temperature on the precipitation threshold is considered. C—**9**.

Vinyl Compounds: Heats of Polymerisation. D. E. Roberts. *J. Res. Natl. Bureau Standards*, 1950, **44**, 221-232. Heats of polymerisation are tabulated for 42 substituted vinyl compounds. Values reported by different authors are given for each compound, with corresponding states of monomers and polymers, and notes on the methods used in obtaining the values. A second table shows the structural formulæ of the monomers. Values for heats of polymerisation to hypothetical polymers devoid of steric hindrance have been calculated from published values of heats of formation of hydrocarbons, on making certain assumptions regarding branch groups. Values of heats of polymerisation are compared and their relation to structure is examined with special emphasis on the effect of steric hindrance. There are 62 references to the literature. C—**9**

Cone and Plate Viscometer. R. S. Higginbotham. *J. Sci. Instruments*, 1950, **27**, 139-141. A brief illustrated description is given of a cone and plate viscometer, which has been devised to determine the flow curves of anomalous fluids over a wide range of rates of shear. The derivation of equations and use of the viscometer are discussed. The instrument is easy to fill and clean, and has proved particularly useful for measurements at rates of shear of 10,000 sec.$^{-1}$ and upwards. Flow curves for typical anomalous systems are shown. C—**9**.

Rod-like Macromolecules in Solution: Intrinsic Viscosity, Translational and Rotatory Diffusion Constants. Jacob Riseman and J. G. Kirkwood. *J. Chem. Phys.*, 1950, **18**, 512-516. A theory of the intrinsic viscosities, translational and rotatory diffusion constants of rod-like macromolecules in solution is developed on the basis of a rigid-chain model made up of monomeric elements separated by

rigid bonds. The intrinsic viscosities, translatory and rotatory diffusion constants are related through a pair of parameters. A proposed method for obtaining the molecular weight of rod-like macromolecules is based on the combination of intrinsic viscosity and rotatory diffusion constant measurements. (See also *J. Textile Institute*, 1949, **40**, A422.) C—**9.**

Cellulose: Infra-red Spectrum; Effect of Deuteration, Oxidation and Hydrogen-bonding. J. W. Rowen and E. K. Plyler. *J. Res. Natl. Bureau Standards*, 1950, **44**, 313-320. Infra-red absorption spectra of regenerated cellulose films were determined after immersion in heavy water. The intensity of the OH vibration in the 3 μ region decreased slightly and a weak OD vibration appeared in the 4 μ region. Results show that under the given experimental conditions deuteration of the film was much less than 50 per cent. The infra-red spectra from 2 to 16 μ of cellulose nitrate, cellulose oxidised by nitrogen dioxide, alginic acid, and sodium alginate are recorded. A comparison of these spectra indicates that the strong band at 5·75 μ in the spectrum of the oxidised cellulose is due to the C=O vibration of the carboxyl group, and that the bands at 6·07 and 7·01 μ are due to N–O vibrations. The intense bands in the 3 μ region of the spectra of a number of cellulose derivatives, attributed to hydroxyl groups, were examined with the aid of the high-dispersion lithium fluoride prism. The minima of the bands were exactly at or close to 2·86 μ. The possibility of the existence of a common type of hydrogen bond in the cellulose derivatives is discussed. C—**9.**

Irradiated Cellulose: Formation of Alkali-sensitive Linkages. T. S. A. Padwanabhan, L. R. Sud, P. F. E. Mann, S. K. Ranganathan and T. S. Subramanian. *Current Science*, 1949, **18**, 47-48 (through *Brit. Abstr.*, 1950, A11, 87). Cellulose linkages weakened by ultra-violet irradiation are alkali-sensitive and the slow post-irradiation effects leading to a fall in the degree of polymerisation can be replaced by boiling with 1 per cent. caustic soda for 8 hours. C—**9.**

Synthetic Polypeptides: Structure. A. Elliott and E. J. Ambrose. *Nature*, 1950, **165**, 921-922. The polarised infra-red spectra of several new polypeptides have been examined. These materials can be prepared in the α-folded form (highly orientated) or the extended β-form (low orientation). The peptide C=O band of poly-L-glutamic benzyl ester and D-L-phenyl alanine L-glutamic methyl ester co-polymer, has two components, at 1658 cm.$^{-1}$ and 1629 cm.$^{-1}$, which are identified with the α- and β-forms, respectively. This observation is discussed with further remarks on the C=O bands and also the N–H bands. C—**9.**

Polarising Colorimeters. S. Rösch. *Farben, Lacke, Anstrichstoffe*, 1950, **4**, 19-20 (through *Chem. Abstr.*, 1950, **44**, 3747^{e}). The chromoscope of Arons and the colour tables calculated for it by Buchwald have been modified for use as a colorimeter. Any hue, chroma, and value can be produced. The device consists of two polarisers (one fixed), a quartz plate, a reflection polariser, a second plate, adjustable in position, and an analyser. C—**9.**

Colour Mixtures: Calculation of Tri-stimulus Values. ("Calculation of Subtractive Colour Mixtures.") H. R. Davidson. *J. Optical Soc. America*, 1950, **40**, 230-231. A set of simple equations for the calculation of tri-stimulus values of subtractive colour mixtures in solution has been developed for the specialised case in which the ratios of transmittances of the component colorants are constant over all wave-lengths in the visible spectrum. The expressions have been tested on mixtures of pairs of acid dyes and are sufficiently accurate for most mixtures in which the colour gamut is small. C—**9.**

Colour Preferences of Various Observers. ("Des goûts et des préférences en matière couleur.") Maurice Déribéré. *Teintex*, 1950, **15**, 175-187, 215-225. A historical survey is presented of investigations on the colour preferences of males and females of various ages and stages of mental development. The author describes his own work in detail. In this, data collected by questionnaires are analysed statistically. C—**9.**

Colour Vision: Natural and Artificial Visual Defects. ("Farbfilter, Farbenblindheit und Farbensehen.") U. Ebbecke. *Experientia*, 1950, **6**, 126-134. Experiments are described in which coloured filters, placed before the eye, were used to produce artificial absorptive visual defects. The most suitable filters were an orange filter with maximum absorption in the blue region, a purple filter with maximum in the green, and a green-blue filter with maximum absorption in the red. These simple experiments permit an understanding of the fact that

an absorptive or defective visual defect never results in red-blindness or green-blindness alone; the general chromatic tone of the visual field is confused with white. They also enable persons with normal colour vision to experience how the colour-blind see colour. The experiments are related to the general theory of colour vision with special reference to the photochemical data on sensitising pigments decomposed by light and to central nervous regulation (antagonistic effects in reciprocal innervation). C—**9**.

High-speed Motion Pictures: Application in Textile Research. E. K. Fischer and J. C. Burnett. *Textile Research J.*, 1950, **20**, 259-269. Applications of high-speed photography to textile research are reviewed and various types of motion-picture cameras are briefly described. The technique for taking high-speed pictures is discussed and some applications are considered, *e.g.* shuttle flight, cotton tyre-cord breaks, heald action, and ring spinning. Several photographs are reproduced. C—**9**.

Refractive Index of Liquids: Measurement. E. G. Knowles and H. Jenkins. *Brit. J. Applied Phys.*, 1950, **1**, 133-134. A critical angle method for the measurement of the refractive index of liquids is described. The apparatus consists only of a prism and a telescope but two specimens of known refractive index are also required. C—**9**.

Spherical Dielectric Particle Dispersions: Macro-distribution of Scattered Light. H. H. Theissing. *J. Optical Soc. America*, 1950, **40**, 232-243. The light scattered by an infinite plane layer of suspended dielectric particles is discussed on the basis of Mie's theory, without consideration of the interference from different particles. The fractions of scattered light are calculated (1) as forward progressive quantity functions for the several orders, to be multiplied by angular factors for any direction, and (2) as separate forward and backward progressive half-space quantity functions for the several orders, to be multiplied by angular factors taken in the corresponding half-spaces. The treatment is mathematical. C—**9**.

Electron Microscope Externally Adjustable Objective Aperture. I. M. Dawson. *J. Sci. Instruments*, 1950, **27**, 142-143. A brief account is given of a mechanism that allows objective aperture adjustment in the electron microscope to be made through the specimen stage controls. The diaphragm is mounted inside the objective pole-piece on a holder having a friction bearing at the base of the diaphragm-carrying tube. This bearing allows lateral movement of the diaphragm when an adaptor engaging on the upper surface of the diaphragm-carrying tube is fitted to the specimen stage, thus translating the specimen stage movement to the objective aperture. The device is illustrated and electron micrographs are shown. C—**9**.

Magnetostriction Vibrator of Aluminium-Iron Alloy. Yoshihito Takesada. *J. Acoustical Soc. America*, 1950, **22**, 290. The electro-acoustical transformation efficiency of a 12·6 per cent. aluminium-iron alloy vibrator is found to be of the same order as that of a nickel vibrator. Results are given for sound transmission measurements in a free field under water. C—**9**.

Photo-elastic Strain Analyser. E. F. Smith and A. P. Wangsgard. *J. Polymer Sci.*, 1950, **5**, 169-178. A photo-electric instrument is described for the determination of the "frozen in" strain levels of materials in sheet form. The principle employed is the measurement of the optical retardation caused by the strains in a beam of polarised light passed through the specimen. The theory is explained and the experimental procedure is indicated. The method has been used as a routine test in the production of "Vinylite" sheets. C—**9**.

Boundary Layer Friction: Physical Problems. ("Physikalische Probleme der Grenzschichtreibung.") Rembert Ramsauer. *Kolloid-Z.*, 1948, **111**, 83-95, 145-155; 1949, **112**, 26-35. (I) Based on the argument that the frictional force is proportional to the contact area of two sliding bodies but independent of the specific area pressure in this contact area, the physical processes in boundary surface friction are related with the deformation processes in the surface of the rubbing bodies. (II) The energy loss in friction is composed of the energy losses in elastic and plastic deformation and the work against the shear strength in the contact surface. The effect of lubrication is essentially the reduction of shear strength by introducing a liquid between the rubbing solids. (III) The mechanism of wear is discussed and the effect of lubricants on wear is considered. C—**9**.

Compressional Waves in Rectangular Rods: Velocity. R. W. Morse. *J. Acoustical Soc. America*, 1950, **22**, 219-223. Solutions for compressional waves in an isotropic rod of rectangular cross-section are formulated from the general elastic equations of motion. Two general modes of propagation are constructed that satisfy the boundary conditions for the free vibrations of a long rod for which the width $2d$ is considerably greater than the thickness $2a$. The thickness mode is shown to have an infinite phase velocity (cut-off frequency) at that frequency for which the half wave-length in an infinitely wide rod would be equal to $2d$. The phase velocity of both these propagation modes is shown to approach that of Rayleigh surface waves when the wave-lengths are much smaller than the lateral dimensions. The calculated thickness mode cut-off frequencies are compared with measurements reported earlier and the agreement is shown to be good. A comparison between the predicted and measured phase velocity dispersion is made for various values of a/d. The agreement is found to be satisfactory as long as d is several times greater than a. C—**9**.

Piezo-electric Crystals: Detection. W. G. Perdok and H. van Suchtelen. *Philips Tech. Rev.*, 1949, **11**, 151-155. An apparatus for the detection of the display of the piezo-electric effect by crystals is based on the method of Giebe and Scheibe by which a number of fragments of crystal are placed between two flat electrodes connected parallel to the tuning circuit of an oscillator. A variable-μ pentode is used as oscillator valve and "wobble tuning" is employed. The dips in the oscillation amplitude when the natural frequencies of the crystals are reached are made audible in a loud-speaker. Circuit diagrams are given. C—**9**.

Piezo-electric Materials. J. C. B. Missel. *Philips Tech. Rev.*, 1949, **11**, 145-150. An introductory survey is given of the subject of piezo-electricity with special reference to piezo-electric materials. The relation between the occurrence of the piezo-electric effect and the symmetry of the crystal is discussed. The piezo-electric properties of KH tartrate and quartz are considered and mention is made of the search for new materials, especially for use where quartz is not wholly suitable. The development of polycrystalline barium titanate in this connection is briefly discussed. C—**9**.

Particles: Length and Thickness Measurement by Electron Microscopy. H. Mahl. *Arch. tech. Messen*, 1948, No. 156, V1121-V1127 (through *Elect. Engng. Abstr.*, 1949, **52**, 225). The author discusses the possible errors which may arise in measurements of particle size and specimen thickness by the electron microscope, and outlines the precautions to be taken in making such measurements. A full bibliography is appended. C—**9**.

Collagen Fibrils: Large Periodic Structure. O. E. A. Bolduan and R. S. Bear. *J. Polymer Sci.*, 1950, **5**, 159-168. Small-angle X-ray diffraction photographs of collagen fibrils have been obtained by using the pin-hole camera and a slit camera. With the latter, one specimen is fixed while a similar one mounted alongside it can be tilted through known angles. The X-ray diagrams of the two specimens are recorded simultaneously. Diffraction patterns of dry and wet fibrils have been obtained with both cameras. The results are considered in the light of criteria for the degree of order in the structure of the fibril, and the conclusion is reached that regular order exists only along the axes of the collagen fibrils, and that transverse regularity must be poor or non-existent. Diffraction displacements with tilt (in dry specimens) suggest that the collagen diffractors possess less than the full complement of three-dimensional order. Wet samples do not yield clear evidence for diffraction displacement with tilt. C—**9**.

Elastomers: Elongation Hysteresis; Measurement with Spider Hysterometer. ("Elongation Hysteresis of Hevea and Synthetic Elastomers.") M. Mooney and S. A. Black. *Canadian J. Res.*, 1950, **28F**, 83-100. In order to study hysteresis at high deformations and fairly highly amplitudes, a "spider hysterometer" has been developed which measures directly the energy loss per cycle of elongation. Six samples are stretched, like the spokes of a wheel, between a small disc and a large disc. The large disc is motor-driven, and the small disc, mounted on a ball bearing, is displaced eccentrically with respect to the larger disc. In the elongation cycle which each sample undergoes with each revolution, the hysteresis causes an average force on the small disc which is normal to the eccentric displacement and is proportional to the energy loss per cycle. A lever and balance system makes it possible to measure this force continuously while the machine is running. Measurements have been made on gum stocks of Hevea and five commercial synthetic elastomers at frequencies from 2 to 60 cycles/second, at tem-

peratures from 0° to 105° C., and over a wide range of mean elongation and amplitude. Results are presented and discussed. C—**9.**

Ethylcellulose Film: Fractional Permeation by Gases. Sol Weller and W. A. Steiner. *J. Applied Phys.*, 1950, **21**, 279-283. The permeability of a number of thin organic films towards oxygen and nitrogen has been measured. For an ethylcellulose film the studies were extended to include carbon dioxide, argon, helium and hydrogen. The enrichment of a binary gas mixture in a single stage of permeation has been calculated for the extreme cases of perfect mixing and no mixing. The results indicate that the use of a fractional permeation process may be of practical importance in effecting the separation of oxygen from air, helium from natural gas, and hydrogen from coke-oven gas, as examples. C—**9.**

Massive Nylon: Structure and Physical Properties. G. L. Clark, H. M. Mueller and L. L. Stott. *Ind. Eng. Chem.*, 1950, **42**, 831-837. The structure and properties of massive nylon ranging in size from 0·011 inch strip to 3-inch rod have been investigated. Results are reported for X-ray diffraction measurements, photomicrography, hardness and density measurements, heat treatment, recrystallisation in various liquid media, and tensile measurements. X-ray diagrams and photo-micrographs are reproduced. C—**9.**

Organic Chain Molecules: Contraction. P. Gombás and T. A. Hoffmann. *J. Chem. Phys.*, 1950, **18**, 563-564. Simple quantum mechanical conceptions are applied to a model of an organic chain molecule to explain some mechanical properties, such as contraction. Particular attention is given to the polypeptide chain and the effects of the presence of N atoms and N^+ ions in the chain are briefly considered. C—**9.**

Plastics: Deformation; Thermodynamics and Generalised Entropy. P. W. Bridgman. *Rev. Modern Phys.*, 1950, **22**, 56-63. The classical conception of entropy and related points of view may be extended to the anticipated experimental situation in the domain of certain irreversible phenomena in solids. The generalised "state" is considered and the case of a body with a repeatable stress/strain hysteresis loop is then discussed in more detail. The case of an ideal plastic body is also considered. Finally a body with a single parameter of irreversibility is dealt with, *e.g.* a binary alloy in which the atoms of the two elements may be arranged either regularly in the space lattice or at random. C—**9.**

Plastics: Elastic Moduli and Wave Velocity; Variation with Pressure and Temperature. D. S. Hughes, E. B. Blankenship and R. L. Mims. *J. Applied Phys.*, 1950, **21**, 294-297. An apparatus for measuring the velocity of waves in plastics is described and illustrated. The variations in velocity of dilatational waves in the pressure range 0 to 15,000 lb./sq. in. and the temperature range 30° to 90° C. have been measured for samples of polystyrene, Lucite, and polyethylene. The velocity of rotational waves was also measured for polystyrene and Lucite. In polyethylene no trace of a rotational wave could be identified. The elastic moduli and Poisson's ratio are computed over the experimental range. C—**9.**

Plasticised Polyvinyl Resins: Prediction of Mechanical Properties by Electrical Measurements. A. J. Warner. *A.S.T.M. Bull.*, 1950, No. 165, 53-57. From a study of the electrical properties of the base resin and the plasticiser it is possible to predict the mechanical properties of the plasticised composition itself. Dissipation factor/temperature curves are shown and discussed and an expression is derived for the temperature at which the dissipation factor of the plasticiser-resin mixture is a maximum. The equation is tested by determining this temperature for various compositions of polyvinyl chloride resin with tricresyl phosphate and dioctyl phthalate as plasticisers. Agreement between calculated and observed values is good for the former plasticiser but not for the latter, for which the deviation of the values was significant. A factor k is derived which gives a measure of the plasticiser potential and its uniqueness, significance and usefulness are discussed. Some values are given for various plasticisers. The correlation of brittle point, flex temperature, and the temperature of the dissipation factor maximum is considered. (See also *J. Textile Institute*, 1948, **39**, A565.) C—**9**

Polyethylene: Mechanical Properties. R. H. Carey, E. F. Schulz and G. J. Dienes. *Ind. Eng. Chem.*, 1950, **42**, 842-847. Stress/strain and torque/deflection curves are reproduced for a series of polyethylene resins varying in mole-

cular weight. By combining the two techniques the stiffness properties have been evaluated with good accuracy over a wide range of temperatures. Over a common temperature range, torsional and tensile techniques yield equivalent moduli. C—**9.**

Mass-produced Articles: Lot Inspection by Sampling. H. C. Hamaker. *Philips Tech. Rev.*, 1950, **11**, 176-182. Methods of taking samples from a large number of articles in order to obtain an estimate of their over-all quality are discussed. Simple, double and sequential sampling systems are considered. The treatment is non-mathematical. C—**9.**

Wool Keratin: Products of Hydrolysis by Papain. S. Blackburn. *Nature*, 1950, **165**, 310. Hydrolysis of wool by papain and sodium bisulphite under specified conditions yielded cortical cells and supernatant solution. The latter on acidifying to *pH* 4 gave a gelatinous precipitate, which formed a hard, horn-like mass on drying. This polypeptide had a disordered β-keratin type of structure. The peptides which remained in solution after acidification were examined by means of paper chromatography and by Sanger's end-group method using buffered columns. The enzyme liberates a large number of different amino groups from the peptide linkages, and in this respect does not exhibit a very high degree of specificity in its action on wool. W—**9.**

Keratin Fibres: Hypothesis for the Appearance of Rubber Elasticity. E. Elöd and H. Zahn. *Kolloid Z.*, 1949, **113**, 10-17 (through *British Abstracts*, Jan., 1950, B II, 46). The effects of temperature, variation and of water, 1·0 N NaOH, Na_2S (1 per cent.), and C_2HCl_3 on the breaking elongation, Young's modulus, and linear thermal expansion coefficient (α) of horse hairs in the dry and swollen state have been examined. In water and in C_2HCl_3, α is positive. Even after partial reduction of the cystine cross-links α remains positive. Super-contraction follows complete breaking of the H bonds between the peptide chains (by action of 40 per cent. aq. resorcinol), becoming negative. NaOH and Na_2S also reverse the sign of α. The appearance of negative α is accompanied by a large decrease in Young's modulus. The data support the view that keratin fibres behave like normal solids, but may acquire rubber elasticity after treatment which ruptures the bonds between the peptide chains. W—**9.**

Wool Protein: Combination with Cations and Hydroxyl Ions. J. Steinhardt and E. M. Zaiser. *J. Biol. Chem.*, 1950, **183**, 789-802. The titration curves of wool at 0° with 12 strong monovalent bases exhibit similar wide differences with respect to position on the *pH* axis, as has been previously demonstrated with acids. Thus, as with anions, the affinity of cations for protein increases with increasing molecular dimensions. Among organic cations of the same weight, asymmetric ions produce much the larger shift. Unlike the effects of anions, which are uniform over the entire acid curve, the effect of cations is more marked on the portion of the titration curve which is also affected by formaldehyde, *i.e.*, the part due to lysine. The maximum shift in position of this part of the titration curve, obtained with tetradecyltrimethylammonium hydroxide, exceeds 2 *pH* units. Marked effects on other portions of the curve are shown only by asymmetric ions larger than the hexyltrimethylammonium ion. Explanations of this distinction have been suggested, as well as of the selective effect on the dissociation of lysine. As with anions, the binding of cations is brought about by van der Waals forces which have an opportunity to manifest themselves only when long range (electrostatic) forces increase the probability of close enough approach. No specific chemical bonds are involved. W—**9.**

10—ECONOMICS

French Rayon Export Trade. *British Rayon and Silk J.*, 1950, **26**, *April*, 88-89. A brief review is given of the rayon export trade of France, with particular reference to 1948 and 1949, with tables showing the geographical distribution of French exports of filament rayon fabrics and rayon yarn and fabric exports by type. Rayon production figures are given for 1949. C—**10.**

United States Rayon Exports and Imports, 1949. *Rayon Organon*, 1950, **21**, 53-59, 59-61. Exports of artificial fibre textiles from the United States during 1949 are surveyed and compared with those of previous years. Tables show classified exports for the years 1939 and 1945-1949. The dollar value of the 1949 exports was about two-thirds of the 1947 peak figure, but was 13½ times the

1939 figure. American imports are tabulated for 1939 and 1947-1949. Figures are given for yarns, materials and finished goods. The value of the 1949 imports was only 31 per cent. of the 1948 and 19 per cent. of the 1939 figures. C—**10.**

American Cotton Weaving Industry: Productivity. Anglo-American Council on Productivity. *Textile Mercury & Argus*, 1950, **122**, 997-999; *Textile Weekly*, 1950, **45**, 1654-1664. The main conclusions drawn from a survey of weaving conditions in the United States are summarised and it is emphasised that high quality in yarns is an essential aspect of the high productivity achieved by automatic machinery. C—**10.**

British Cotton Industry: Output and Employment, April, 1950. *Board of Trade J.*, 1950, **158**, 1266-1267. Figures are presented for cotton yarn and cloth production and employment and machinery activity for the years 1945 to April 1950. Monthly figures are given for 1949 and 1950 (to April). The Easter holiday lowered the weekly averages during April in all sections. Employment at April 29 was a post-war record. C—**10.**

Indian Textile Industry: Development. —. Srinagabhushana. *Indian Textile J.*, 1950, **60**, 488-490. A synopsis of a lecture in which a brief account is given of the growth of the Indian textile industry from the earliest recorded times to the present day. C—**10.**

Spanish Textile Industry. Alberto Barella. *Fibres*, 1950, **11**, 157-164. The present condition of the Spanish textile industry is surveyed. The author gives notes on the production of fibres and their processing, and also deals with textile machinery, education, research and publications. The article is illustrated. C—**10.**

Swiss Rayon Export Trade. *Brit. Rayon and Silk J.*, 1950, **26**, May, 96-97. A brief review of the Swiss rayon export trade is given. Exports of filament and spun rayon fabrics to various countries during 1947, 1948 and 1949 are tabulated. C—**10.**

Swiss Textile Printing Industry: Development. ("Die Entwicklung der Textildruckerei im Kanton Glarus.") R. Freuler. *Textil-Rundschau*, 1950, **5**, 123-134. A detailed historical account is given of the development of textile printing in the Canton of Glarus, including statistics from the year 1869 giving the names of 22 firms, their products, number of printing tables, rollers, and operatives employed, and average daily earnings of different categories of printing operatives. C—**10.**

Swiss Textile Industry: Development and Prospects. ("Die Entwicklung der schweizerischen Textilindustrie und ihre Zukunftsaussichten.") Alfred Bosshardt. *Textil-Rundschau*, 1950, **5**, 155-165, 221-224. A detailed account is given of the development of the textile industries in Switzerland under the following main headings: (i) Introduction; (ii) Extent and integration of the Swiss textile industry; (iii) Development of the Swiss textile industry from the medieval home industry; (iv) Mechanisation of the textile industry in the 19th and 20th centuries, and its spread over the whole world; (v) Consequences of the textile mechanisation of the world for the Swiss textile industry; and (vi) Future prospects. C—**10.**

Textile Wholesale Prices, May, 1950. *Board of Trade J.*, 1950, **158**, 1200-1201. The index numbers for May 1950 are: Cotton, 373·3; Wool, 432·3; Other textiles, 187·4; All articles, 254·5. An increase in price of American middling cotton led to higher prices for American type yarns and cotton cloths. The rise in wool prices continued in May, and the group index went up by 5 per cent. C—**10.**

Wages in United States Cotton Mills. National Association of Cotton Manufacturers, Boston. *International Cotton Bull.*, 1950, **18**, 64-66. The following tables of cotton mill wages in the U.S.A. are presented: (i) Average hourly earnings in cotton textile mills, 1920-1949; (ii) Consumers' price index, average weekly earnings in Northern and Southern cotton textile mills, and average weekly earnings adjusted by consumers' price index, 1939-1949; and (iii) Comparison of straight-time hourly earnings for selected occupations in the cotton and rayon textile industries—by area—in April, 1949. C—**10.**

Cotton and Wool Industries: Employment, Production and Exports. *Board of Trade J.*, 1950, **159**, 3-4. The man-power position in the cotton and wool industries since 1948 is discussed. Recruitment and incentives to improve it such as improved amenities and redeployment are mentioned. Figures are given to show the main changes in employment, production and exports since the formation in 1948 of the Parliamentary Committee to study textile labour problems. **C—10.**

Japanese Synthetic Fibres: Development. Kyuichi Mizutani. *J. Soc. Org. Synthetic Chem. Japan*, 1949, **7**, 83-87 (through *Chem. Abstr.*, 1950, **44**, 4681[f]). Synthetic fibres and their by-products reported in 1948 are reviewed. Among the Japanese products are mentioned amilan (polycapramide), nylon from nylon waste, and polyvinyl fibres. **C—10.**

United States Hosiery Industry: Output, 1949. *Rayon Organon*, 1950, **21**, 73-76. American hosiery production data are presented for the years 1939-1949. The production of the various types and gauges of hosiery is discussed, and the results of an opinion survey on hosiery are summarised. **C—10.**

United States Rayon Production, First Quarter, 1950. *Rayon Organon*, 1950, **21**, 67-73. The production of rayon in the U.S.A. during the first quarter of 1950 is reviewed. Quarterly data on the production of rayon by process and type and on rayon filament yarn deliveries by trades are given for the years 1946-1950. Charts show the trends in production and deliveries from 1940 to date. The production of rayon in the United States during the first quarter of 1950 was 5 per cent. higher than the previous highest figure. **C—10.**

11—INDUSTRIAL WELFARE, INDUSTRIAL PSYCHOLOGY AND EDUCATION

American Textile Education Film Aids. *Textile Industries*, 1950, **114**, No. 4, 193-201, 285, 287. A list is given, with brief descriptions, of American films, film strips, and slides for textile education purposes. Addresses of suppliers are provided. **C—11.**

German Institute for Fibre Research. ("Institut für Faserstoff-Forschung.") *Kunstseide u. Zellwolle*, 1949, **27**, 461. The foundation of an Institute for Fibre Research by the German Academy of Science in the Eastern zone of Germany is announced. The institute started work on January 1st, 1949. **C—11.**

Knitwear Loopers: Training; Use of Vision Aids. R. K. Karn. *Textile World*, 1950, **100**, No. 5, 109, 298, 300, 303. The use of vision aids, such as the magnifying glass spectacles and correct lighting, in the training of knitwear loopers is discussed. **C—11.**

Overlooker: Fatal Accident in Weaving Room. *Ind. Accident Prevent. Bull.*, 1950, **18**, 31. A fatal accident that occurred while an overlooker was adjusting a loom is reported. The shortcomings of the usual system of notifying the operator that the loom is ready for use are stressed. **C—11.**

German Institute for Fibre Technology. ("Das Institut für Technologie der Fasern.") *Kunstseide u. Zellwolle*, 1950, **28**, 73-74. It is reported that the Institute for Fibre Technology at Copitz near Dresden has been incorporated in the German Academy of Science. The tasks and functions of the Institute are outlined and a list of the members of Council is given. **C—11.**

Rhode Island School of Design. *Whitin Review*, 1950, **17**, No. 1, 1-24. An account is given of the lay-out, organisation and work of the Rhode Island School of Design. This school has recently installed pilot plant equipment to deal with all fibres from the raw state to the finished cloth. Many photographs showing machinery and aspects of the activities of the school are given. **C—11.**

Machine Operators: Time Study by the Snap Reading Method. P. D. Vincent. *Machinist*, 1950, **94**, 995. An outline is given of the Snap Reading method of time study (as employed in the Technical Economy Department, the Shirley Institute) and known in the United States as the Ratio/Delay method. A survey in an engineering shop could take the form of a systematic patrol by the observers in which they entered on a suitable chart code letters to indicate what the operator was doing under a suitable list of tasks, say, loading the machine,

machining, unloading, inspecting the product, cleaning and oiling the machine, or relaxing. When enough observations had been made (say, 3,000) the records would be analysed and the percentages worked out under each heading. These percentages would then be converted into seconds by multiplying them by the average time in seconds to produce one article, this being derived from the total production during the study period, the time and the number of operators. The snap reading method leads to a measure of the average relaxation time, which is not provided by normal time-study methods **C—11.**

Time Recording Instruments: Application in Spinning Mills and Finishing Works. ("Zeitschreiber und Leistungsteigerung im Betrieb.") J. Vetter. *S.V.F. Fachorgan*, 1950, **5**, 93-100. The writer discusses the possibility of fitting finishing machines with time recorders and, in support of his claims for the advantages of such devices in checking and improving output, gives an illustrated account of the application of the Hasler recorder in a spinning mill. **C—11.**

Textile Organisation and Production. Chap. III. A. E. Clifford. *Fibres, Fabrics & Cordage*, 1950, **17**, No. 3, 82-85. Early investigators of the principles of management stressed the need for the division of labour, use of standard methods of working, measurement of performance of work, and economic operation. Unity of management and of command are of much importance. **L—11.**

Textile Organisation and Production. Chap. IV. A. E. Clifford. *Fibres, Fabrics & Cordage*, 1950, **17**, No. 4, 116-120. This chapter deals with the dues and duties of the supervisory staff. Dues include adequate training, fair dealing, loyalty, support of reasonable action, clear instructions from the management, adequate provision of all means of production, and the possibility of recreational facilities. Responsibilities of the supervisory staff include competence in quality production and keeping it up to the required standard, suitable employment of skilled workers, co-operation with functional executives, training of suitable deputies, conversance with the progress of technical developments, and dealing with minor grievances. **L—11.**

Textile Organisation and Production. Chap. V. A. E. Clifford. *Fibres, Fabrics & Cordage*, 1950, **17**, No. 5, 154-160, 168. This chapter is on industrial budgets—responsibility for their preparation, duration (which may be for any convenient period), and type. Four types are discussed, covering sales programme, production programme, material and labour requirements, and financial control. **L—11.**

12—CONFERENCES AND EXHIBITIONS

Basle Fair, 1950, Textile Machinery Exhibits. *Textile Recorder*, 1950, **67**, May, 90-91. Some of the new features in textile machinery exhibited at the 1950 Basle Fair are briefly described and illustrated. They cover modified drafting arrangements, pirn winders, loom developments, and broadcloth and smallware looms. **C—12.**

British Industries Fair, 1950, Textile Materials and Equipment. ("The Mill Manager's Guide to Castle Bromwich.") *Textile Recorder*, 1950, **67**, May, 66-81. An illustrated account is given of some of the exhibits of interest to the textile industry at the Castle Bromwich section of the 1950 B.I.F. They include motors and drives, electrical equipment, scientific instruments, chemicals, pumping equipment, mechanical handling equipment, textile machinery, and textile materials and made-up goods. **C—12.**

All-India Textile Conference, 1950. *Indian Textile J.*, 1950, **60**, 454-474. A report is given of the seventh All-India Textile Conference held in Bombay, March, 1950. The addresses are recorded including an account of a symposium on spinning. **C—12.**

American Association of Textile Technologists Conference for Advanced Study of Rayon and Synthetic Textiles. D. E. Douty. *Papers Amer. Assoc. Textile Techn.*, 1950, **5**, 79-84. An account is given of the proceedings of a Conference held in November, 1949, with brief summaries of the papers. **C—12.**

High Polymers: Physics. American Physical Society. *Phys. Rev.*, 1950, **78**, 357-359. Brief summaries are given of 22 papers presented at a meeting of the division of high polymer physics of the American Physical Society at the Brooklyn Polytechnic Institute in February, 1950. **C—12.**

Optical Society of America: Proceedings of the Winter Meeting. *J. Optical Soc. America*, 1950, **40**, 254-267. Abstracts are given of papers presented at the winter meeting of the Optical Society of America (March 1950), and include a paper on the ultra-violet dissociation spectra of nylon and one on a new automatic colorimeter for cotton. C—**12.**

Work Study in the Cotton Industry. Cotton Board. *Textile Weekly*, 1950, **45**, 1194-1198, 1262-1272, 1326-1336, 1530-1538; *Textile Mercury & Argus*, 1950, **122**, 753-4, 760-5, 779-782, 803-819, 857-861. Reports of the Cotton Board's Work Study Conference at St. Anne's-on-Sea, May 7-9, 1950. The following papers were discussed: T. M. Pearson, "Work Study, Management Implications"; R. M. Marks, "Work Study Department, its Functions in the Mill"; John Leigh, "Work Study—Past, Present and Future"; E. P. Harries, "Trade Unions Implications of Work Study"; S. Angus and H. Moss, "Human Problems in the Application of Work Study". C—**12.**

British Industries Fair, 1950. (1) *Textile Manufacturer*, 1950, **76**, 223-229. (2) *Brit. Rayon and Silk J.*, 1950, **26**, May, 68-71. (1) Brief details are given of some of the exhibits of interest to the textile industry at the 1950 B.I.F. (Castle Bromwich, Earl's Court and Olympia). (2) A report of the Castle Bromwich section of the B.I.F. is given under the following headings: Rayon spinning pumps; Carpet machinery; Power transmission; Measuring and counting instruments; Electrical equipment; Ventilation; Mechanical handling. C—**12.**

Physical Society Exhibition, 1950. *Ind. Chemist*, 1950, **26**, 209-214. Brief details, with illustrations, are given of some of the instruments shown at the 1950 exhibition of the Physical Society. C—**12.**

Confederation Internationale du Lin et du Chanvre. *Linen Trade Circ.*, 1950, **36**, May 6, 1. Representatives of Belgium, France, Italy, Holland, Germany, Austria, Denmark and Switzerland were present at the constituent assembly of the Confederation held recently in Paris. The Confederation plans to correlate research, raise fibre production and quality, prevent price reductions, and find new outlets. L—**12.**